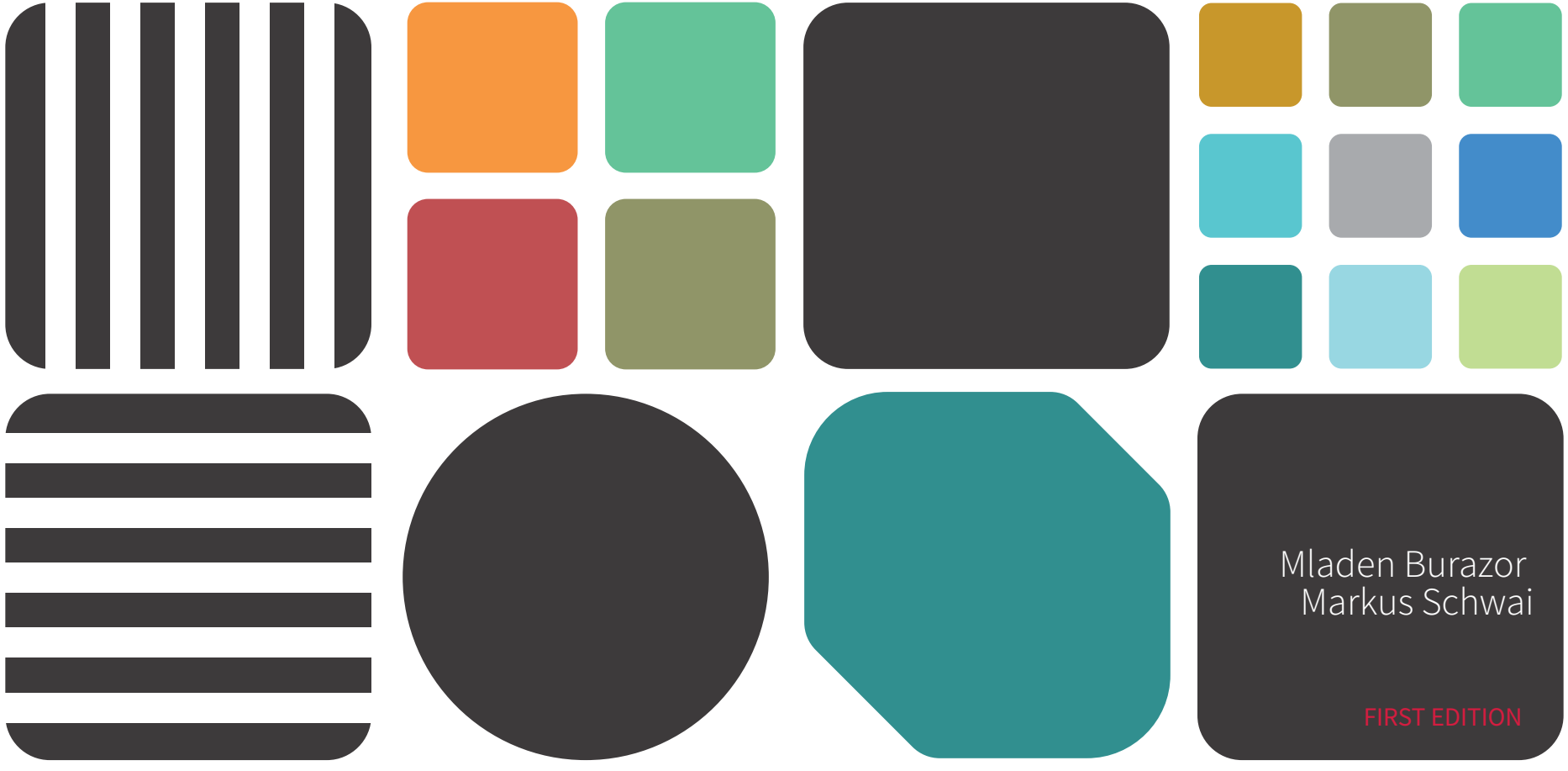
(A)TYPOLOGY INDEX

An overview of typical and atypical architectural concepts



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FIRST EDITION

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University of Sarajevo, Faculty of Architecture
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Contents

Introduction

This book comes as a result of more than a decade of joint observation, research and discussion between the authors on the field of urban planning and architectural design. The authors are involved both practically and academically in this field in both Norway and Bosnia and Herzegovina. Faced with different tasks, whether they were architectural competitions, projects or grading student tasks (semestral projects, master and PhD theses), different typologies have always "crossed our paths" and captivated our interest. There are many examples of architects specialising in single building typologies (such as housing, hospitals, stadiums, swimming pools, industrial buildings, etc.), but depending on the size of the market, architects may often get commissions for different projects. Both in Norway and Bosnia and Herzegovina (BH), there are a number of examples where a single architect has been main designer of public buildings, hotels, shopping malls, underground garages, residential buildings, and also the interiors of small cafés, shops and restaurants. Although the typologies mentioned here are the most common, there are rare opportunities for architects to explore others that are less frequent. One example would be designing children's home (Cebra architecture, 2013) in Denmark and regardless of in which country it is built, how often in a lifetime does one get an opportunity to design such a building? The same can be asked for architectural pavilions (Serpentine Galleries, 2024) or hybrid buildings (Architects, 2023). For these reasons, we chose to present in this book our views on the overwhelming topic of architectural typologies. We proposed, categorised and structured this book in such way that will be part of an ongoing process which is continuously evolving. At this stage, we merely give a cross sections of the existing and selected works in an effort to make 'less familiar' readers 'more familiar'. As pointed out, there are well known typologies that have been covered in great detail but others did not get much attention. One of the reasons we allocated more space on the less known/less familiar is to attempt to "fill holes" in the existing categorisations. The selection/given examples/ presented work come as a result of ongoing research, discussions, personal explorations and means of availability. This approach will add significant value when compared to better known or arbitrary examples.

We see this book as a collection of types covering main themes/topics whilst being aware of the impossibility of completeness. We furthermore took this situation as a starting point for an intermediate representation of the infinite possibilities of classifying and presenting of archetypes. This is why even the presented form of this publication offers plenty of opportunities of later adding/cutting/changing of the material.

This publication is planned to be published and the republished in several versions/editions over time, based on feedback, changing needs and the availability of cases. The comments of students, educators, architects and other practitioners or readers are essential in this process of revision.

About typologies

From the very beginning of human history, we can see how our ancestors made their shelters in a common manner, which we can now easily classify according to type. This can hardly apply to caves which were first used as living spaces, since they are naturally occurring and hence unique, but the very minute that humans started building artificial settlements, we can recognise certain, common patterns. Houses built on rivers and riverbanks share the same "code" regardless of the location in the world. This is also true for those nomadic tribes who used to carry their own homes and place them in various suitable spots. A Mongolian "Ger" and Native American "Wigwam" share the same organisational and construction logic. There can be a difference in materials or even shapes such as dome-shaped vs cone-shaped, but in essence they all share the same genealogy. This classification according to the common elements and similarities, brings us to the building typology that is now far more complex compared to the very beginnings. Now we see all around us different types of houses, public buildings, commercial, office and industrial buildings but also buildings that hardly fit into well-established typologies. Our intention here is to show examples of those general types in a structured manner and look for reasons behind the common elements, but also differences.

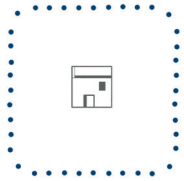
We are aware that there are a number of books and publications and even building codes dealing with the topic of classification of buildings in a systematic order. Based on different methodologies and different criteria, the lists of such building types differ from one another. In some publications, programmatic / functional criteria are used yet, in others they might be compiled from building layouts / configurations, building forms, stylistic (historical) references, etc. In this publication, focus was shifted from the most commonly described typologies and more room was left to share more about those that are not covered that much. For example, housing typology is well documented in almost every country and there is no point in trying to elaborate it further when readers can go directly to those sources. Therefore, in this book only a brief overview was given on such topics and for many other "most common" typologies there was no real need to elaborate further. That goes for many other typologies around us such as museums, hospitals, offices, industrial buildings, etc. At the same time, great effort was given to elaborate on the atypical or non-typical buildings, where we covered in more detail the reasons for their existence and their importance for architectural thought. This is where the true value/contribution of this publication can be seen. Readers will also notice a difference in the amount of information given for certain categories. For some examples, photographs are enough to illustrate the idea/concept/context yet others are given in a more detailed form of drawings, technical data and spatial diagrams. Where applicable, timelines are also created just to link important historical references on the specific architectural discourse.

Overall, this publication is a reflection of authors' critical thinking and it represents our contribution to the never-ending discussions on the references in architecture.

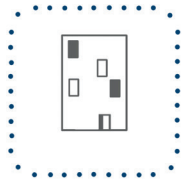
Housing

The most-built architecture worldwide is in the form of housing. Still, we are not dealing with this typology in this publication because there is a vast amount of material available on this topic (Arnautović-Aksić, et al., 2016). Some of the examples used are based on geographical region of the Balkans. Architecture is characterized by heterogeneity for primarily two reasons: there are no two identical sites with the same requirements in terms of construction, and the other is the author's stamp that every architect leaves. The buildings are the result of the author's work, where originality is valued, so they are unique creations, unless they are standard solutions such as prefabricated houses. Yet, despite its diversity, it is possible to find common characteristics among objects and thus generalize individual groups. A good example of this claim is a research project on housing architecture in Bosnia and Herzegovina (BH). At the initiative of the German Organization for International Cooperation (GIZ), data was collected and analysed according to the TABULA methodology[1], and the classification and evaluation was performed of types of residential buildings in BH, from the point of view of their energy efficiency. The published book entitled "Typology of residential buildings in Bosnia and Herzegovina" defines several types of buildings that are generally divided into two groups, individual and collective housing (Arnautović-Aksić, et al., 2016). Since that book presents the entire methodological framework and presents the results of the research in detail, no further elaboration is needed here, and the contribution to this material is a scientific work that builds on the research (Salihović, Burazor, & Zagora, 2016).

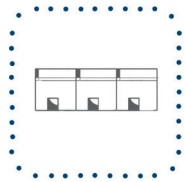
In general, these are the most common residential typologies:



A.1 SINGLE-FAMILY HOUSE



A.2 MULTI-FAMILY HOUSE



A.3 TERRACED HOUSE

A.4 APARTMENT BLOCK

1 http://webtool.building-typology.eu

For many people, housing typology is the most familiar and relatable building category and if asked generally, they could easily distinguish two main groups: single-family houses and multi-family houses. This has to do with our prior experience of building homes and seeking accommodation. Furthermore, there are already established categories within online search applications for accommodation, where people can browse and filter information based on their needs and preferences. In those terms, only a few do not know the difference between the flat and a house. Historically speaking, it is interesting to notice that even those two basic groups, in some countries, did not exist until the end of 19th century. A good example of this can be found in BH, which was under the rule of Ottoman empire from the 15th until the end of 19th century. More precisely, the year 1878 was a milestone for the new ways of living and working in BH. Prior to this, people lived only in a single-family houses in exclusively residential parts of the town and worked at workshops and stores in a commercial part of the town. This division between living quarters and working areas in the city was based on the feudal system, but was also deeply linked to religion. It was considered inappropriate for people who were not related to each other, to live in close proximity to one another. This all changed when the Austro-Hungarian empire took control of BH. It was only then that the multi-family buildings were introduced, which affected the city-scape in terms of urban planning. More importantly, a combination of the workplaces and shops in the ground floors, meant that "work" was brought close to home. So, private spaces/quarters were brought in extreme proximity to the public spaces and many had to adjust to the new ways of living. Yet it still proved to be very difficult to differentiate beyween some of the categories.

Table 1 – Building type matrix for residential buildings

↗ (Source: https://episcope.eu/building-typology/country/).

Country	Single-family house	Terraced house	Multi-Family House	Apartment Blok
Austria	x	x	x	x
Bosnia and Herzegovina	x	x	x	x
Belgium	x	x	x	x
Czech Republic	x	x	x	x
Germany	x	x	x	x
Denmark	x	x		x
Spain	x	x	x	x
France	x	x	x	x
England	x	x	x	x
Greece	x		x	
Hungary	x		x	x
Ireland	x	x		x
Italy	x	x	x	x
The Netherlands	x	x	x	x
Norway	x	x		x
Poland	x	x	x	x
Serbia	x	x	x	x
Sweden	x		x	
Slovenia	x	x	x	x

A HOUSING

A 1.
SINGLE-FAMILY HOUSE

A 2.
TERRACED HOUSE

A 3.
MULTI-FAMILY HOUSE

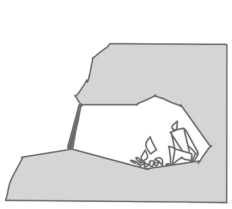
A 4.
APARTMENT BLOCK

When trying to understand energy consumption and plan energy efficiency measures, it is useful for any government to have information on current building stock. Numbers of types of building vary from one region in Europe to another and what we can observe from Table 1, is that some of the general residential categories are, in terms of presence in a country, negligible. This is the case with Greece, Hungary and Sweden where 'terraced' or row-housing is scarce, and from the point of applying EE measures, not relevant. In Denmark, Ireland and Sweden, there are not that many multi-family houses and in Greece and Sweden the apartment block category is not that well represented. The single-family typology is however the most common and in terms of numbers, most relevant category to which to apply EE measures (Salihović, Burazor, & Zagora, 2016).

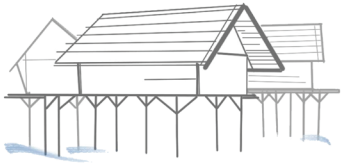
This is an example of how typological classification (following one defined set of variables) can be used to, for example, indicate energy measures. However, each building typology can be classified according to a lot of different criteria such as shapes, materials, location and so on.

Source: https://af.unsa.ba/publikacije/Typology_of_Residential_Buildings_in_Bosnia_and_Herzegovina.pdf

HISTORICAL EVOLUTION



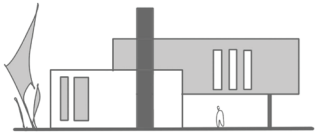
WIWGAM tent made by
Native American tribes



STILT HOUSES

TERRACED HOUSES

FIRST PASSANGER
ELEVATOR/ VERTICAL
DEVELOPEMENT



MODERN SINGLE FAMILY HOUSE

around Paleolithic age
Living in caves
first stone tools

around 12.000 BC

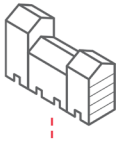
around 7000 BC

around 3000 BC

500 BC

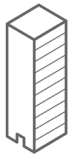
present time_ 21 century

19th century



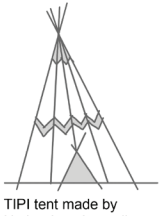
APARTMENT BLOCKS

SOLITAIRE BUILDING



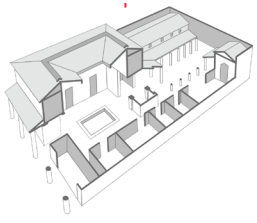
MODERN HIGH-RISE
RESIDENTIAL BUILDING

MULTI-FAMILY HOUSE



TIPI tent made by
Native American tribes

YURT/GER tent made by central
Asia Mongolian nomads



ROMAN VILLA - DOMUS

BOSMAL CITY CENTER 2006

GER – by Yosemite
https://commons.wikimedia.org/wiki/File:Mongolia_Ger.jpg

WIGWAM – by Edward S. Curtis (1868–1952)
https://commons.wikimedia.org/wiki/File:Apache_Wickiup,_Edward_Curtis,_1903.jpg

bosmal sarajevo - Sarajevo, Bosnia and Herzegovina - Novo Sarajevo | Openverse - "Sarajevo, Bosnia and Herzegovina - Novo Sarajevo" by jaime.silva is licensed under CC BY-NC-ND 2.0.

LIFT – drawing by Unknown author
https://commons.wikimedia.org/wiki/File:Elisha_OTIS_1854.jpg

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Public Buildings

Historically speaking, public buildings have implied the use of government funding and ownership. Originally, they were built to conduct the state's business in fulfilling the specific needs of citizens. This was true not only for government buildings but also many other such as educational, healthcare buildings, sports, religious buildings and transit buildings. Roman temples for example were built to serve community just the same as public baths or sport arenas. It was perfectly understandable that the government should finance public works since they were built in the common interest and were the reason why taxes were collected (apart from imperative of providing safety). But, throughout more recent history we can see that many of aforementioned categories are today privately owned and financed. We can find private airports, hospitals, schools, kindergartens, and universities and most of the stadiums (or arenas) are now privately owned. So, the original premise of public buildings being linked to the public ownership, no longer stands. Rather, today the word "public" means it is of public interest and often publicly accessible. With the emergence of secular states, religious buildings are no longer funded by public money but by different, often religious groups and private activities.

B.1 RELIGIOUS BUILDINGS

B.2 EDUCATIONAL BUILDINGS

B.3 LIBRARIES

B.4 THEATRES

B.5 MUSEUMS

RELIGIOUS BUILDINGS

Over the millennia, religion has had a significant influence over society, culture and civilisation as a whole. Our primitive ancestors observed natural phenomena and in an attempt to explain them, turned to supernatural explanations. Questions about the afterlife have been present since the very beginning and we can observe this through the numerous monuments and tombs built for the purpose of ensuring transition (or safe passage) to afterlife for the deceased. Egyptian tombs contained all the necessary artefacts that were believed to be needed in the afterlife and the 5000-years old pyramids serve as a good example of those beliefs. Stepped pyramids found in Mesopotamia and Egypt, are very similar to those built in South America, built before Cristopher Columbus even "discovered" it. Either it is a pure coincidence or, in the terms of building typology, it has to do with the migration of people from Africa and Asia, across the North America which brought that specific "building code" and applied it to another religion.

In Europe, we were exposed to many religious influences: Egyptian mythology, followed by Greek and Roman religions, which had a profound effect on the design of religious buildings. For the Greeks, temples were the "houses for gods" and only certain priests had access to them. This pattern was seen in the earlier Egyptian rituals where "ordinary" people could not even approach the colonnades of the buildings, and high priests had to grant access to other "mortals". From history books on architecture, we learn that the concept behind basilicas is based on ancient marketplaces, conveniently adopted to new use. From the monotheistic religions, we can see that Judaism, Christianity and Islam, have had and still have predominant influence/role in Europe (but also in the rest of the world). Those basilicas, with the cross introduced in the floor plans, are a perfect fit for Christian religious needs. Early Islamic religious buildings, mosques, share the same characteristics as Roman temples and Christian (Byzantine) churches, since many of those were simply converted to fit other religious rituals. Through the parts of Europe that were under the Ottoman Imperial rule, we can observe similarities between the old and new religious buildings. After all, in the collective perception of mosque buildings, the Hagia Sophia Grand Mosque is seen as a "grand template" for other mosques that were built afterwards, although it was originally built to accommodate Greek Orthodox christians. Just as we can observe the similarities within major monotheistic religions, we can observe the similarities within religious building designs. For that reason, it does not come as surprise that today we can see many multi-confessional spaces being built to accommodate various religious groups under the "same roof".

Ferhadija Mosque, Sarajevo. Source: Authors.

Cathedral, Sarajevo. Source: Authors.

EDUCATIONAL BUILDINGS

The introduction of a public educational system and obligatory primary education for all children has had, arguably, the most profound effect on mankind. The amount of fundamental discoveries that shaped our lives today, is directly linked to the establishment of widely available educational systems. In the moment when everybody had access to accumulated knowledge, it meant that those with talent, skills and intelligence could build upon existing knowledge. Before that, only the privileged ones (talented or not) had access to tutors and books. In what world would we live if Nikola Tesla, for instance, had not had access to previously acquired knowledge? In many countries, there is an ongoing debate on how to reshape educational systems. Many advocate for the privatisation of education and use examples such as some of the best ranked universities in the world, which are privately owned and in many cases shape the new leaders of the "free" world. Others insist on government/public funding of the schools to ensure equal access to all young individuals. Either way, schools are for many "other homes" for at least 12 years of their lives and in that sense, they deserve special treatment.

Primary school "Veli Vrh", Pula. Source: authors.

LIBRARIES

Another milestone in the history of civilisations, was the introduction of writing. Until that point, knowledge was passed orally from one generation to another and in that process, much information was inevitably lost. So, when our ancestors learned how to write down thoughts, ideas and information onto stone, pergament and finally papyrus, the next step was to collect all that written material and store it one place where others can use it and benefit from it. First, libraries such as those in Syria and the famous library in Alexandria, were founded hundreds and even thousands years before the new era. The new library of Alexandria, designed by Snohetta, that was built at the turn of latest century, is designed to house up to 8 million books (Zahran, 2007). Although this building is very recent, it was constructed before the digital revolution, when books were the main source of information, research and learning. With the advance of online search engines and abundance of materials placed on the world-wide-web, it became much easier to find and reach required information. So, one might ask, is there a need in modern world for libraries anymore? In today's society, we strive to reach the "paperless age" where a majority of work is conducted digitally and there will be no need for deforestation in order to produce paper for office work. We can already see transitions on constructions sites, where with the aid of BIM, sheets of paper with printed drawing designs, have become obsolete. Many new books have been published only digitally and are being sold in the same manner. For those reasons, libraries are inevitably going to change and transform into places for socialisation and collaborative work among pupils and students. Social and cultural centres have emerged as a place of gathering people focusing mainly on specific demographic groups (such as youth centres all over the world) and/or ethnic/national/religious centres (such as Aboriginal cultural centres found in Australia).

New National Library of France, Paris. Source: authors.

THEATRES

Drama as a form of expression comes as: melodrama, comedy, tragedy and as the combination of the last two, i.e. tragicomedy. Acting or performing arts date to the period before the new era and most commonly we attribute drama to ancient Greek writers. Not much has changed to this day in terms of the structure of drama and in many schools around the world children still read about Sophocles tragedy “Antigone” or Aristophanes comedy “Lysistrata”. For the purpose of staging plays, the Greeks built amphitheatres, where large numbers of viewers could be seated. These radial-shaped, open-air places were built on convenient, naturally occurring, slopes so that a direct line of sight towards the stage could be established. Another, key requirement for those places was great acoustics, so that even a whisper produced by actors could be heard in the most distant rows. The proscenium, coulisse and the orchestra remain the main elements of the stage to this day, and in very simplified way of looking at things, the only difference between the ancient Greek open-air amphitheatres and todays theatres, is that now we have enclosed space or more precisely, walls and roof to protect the audience and actors from the weather.

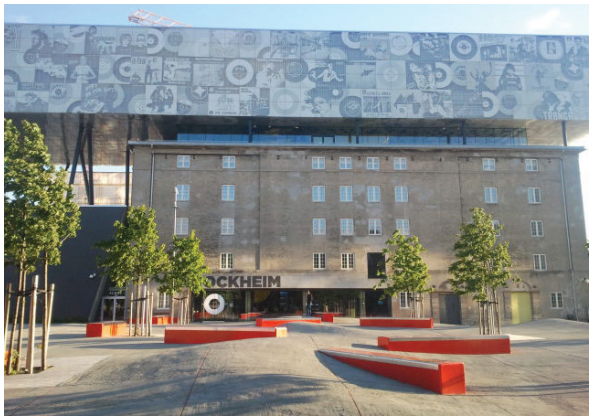
With the invention of photography and the first motion pictures (movies) later in the 19th century, theatres now served as places to project movies. Soon afterwards, cinemas were being built with the sole purpose of screening movies. Modern cinemas have multiple halls and can simultaneously show several films but also include children’s playgrounds, cafés and other complimentary facilities.

Sarajevo National Theatre, Sarajevo. Source: authors.

MUSEUMS

Whether they are about Natural Science, Technical or Contemporary arts, museums all share the same concept of providing safe spaces to exhibit precious artefacts. Another common factor is that they are designed with primary objective of creating large enough space to place those artefacts. If it is a museum of aviation, then for obvious reasons, the building has to be large enough to house planes and even rockets. In the natural sciences and history, we can see skeletons of extinct species which are even larger than planes. However, it is not uncommon that we can see the examples of converting existing buildings such as railway stations (Musee d'Orsay), large military warehouses (Estonian national Museum) or even turbine halls (Tate Modern) into museums. Those buildings, even though they were not initially designed to be museums, by the end of their revitalisation process, became landmarks.

Historical museum, Sarajevo. Source: authors.



Rockheim - Rock museum, Trondheim. Source: authors.

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Commercial Buildings

C 1. RETAIL

Trade has almost always been a part of human activity, but when agricultural settlements developed, the nomadic lifestyle was replaced by a more stable lifestyle. This lead to a greater specialisation of activities and food for an entire community could now be provided by just a few percent of the population. This meant that others could take part in different activities and new occupations became possible, including the production of goods and services.

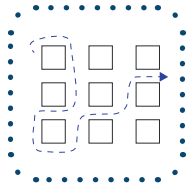
Marketplaces became the centre of almost every town and city, making it possible for people to get access to the goods and services in a convenient way. At the marketplace people could compare goods based on quantity, quality and price, which meant that the merchants had to compete for customers.

When currencies became the means for exchange, retail developed further. It made it possible to transfer the value of goods with common agreement so that people no longer needed to directly trade items, but instead use the “value” another time and place.

Retail later moved indoors and the temporary nature of trading disappeared. Covered streets became normal in the eighteenth and nineteenth centuries and when the industrial revolution was over, shopping in comfortable indoor climate, had become a leisure time activity.

Department stores, shopping centres and supermarkets grew as a result of new inventions, construction techniques and private economy.

When Henry Ford developed mass production of cars, modern shopping centres developed further. It became easy to travel and, supported by development of refrigerators, easy to buy in large quantities. Suburban shopping became convenient due to land prices, size and accessibility. Shopping malls developed, and during the 1950s, they started to replace the traditional ‘downtown’ areas, and until today these malls have continued to develop with public functions, mail offices, cafes, restaurants, several department stores, cinemas, amusement parks, aquariums, ice rinks, child care etc.



C.1.1 MARKETS

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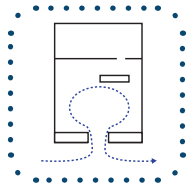

C.1.2 RETAIL STORES

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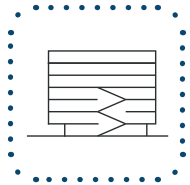

C.1.3 SHOPPING MALLS

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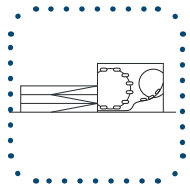

C.1.4 MEGA MALLS

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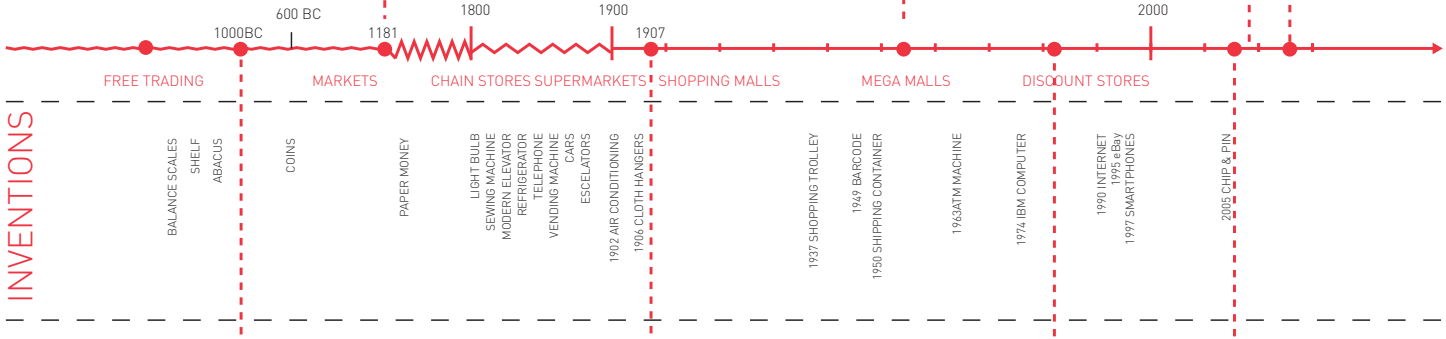
RETAIL
HISTORICAL EVOLUTION

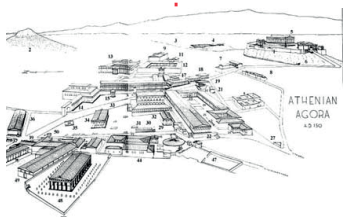
1181 RIALTO BRIDGE

1956 SOUTHDALE MALL

2008 DUBAI MALL

2015 ROTTERDAM MARKET HALL





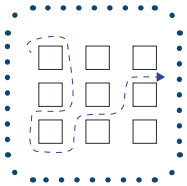
AGORA AND TOWN SQUARES

1907 ROLAND PARK

1981 WEST EDMONTON MALL

2006 APPLE STORE, 5TH AVENUE

RETAIL MARKETS



C.1 MARKETS

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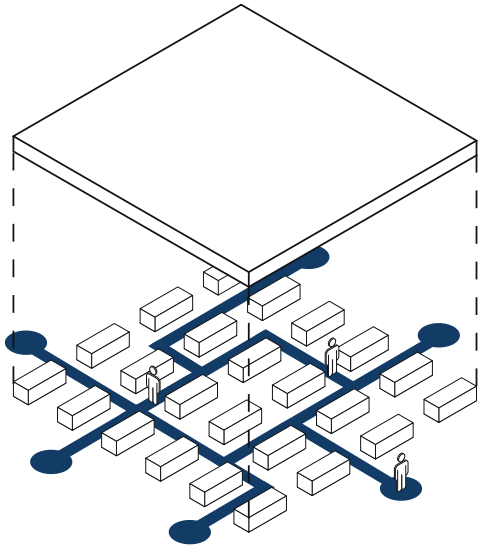
STRUCTURE: Temporary / permanent
CONFIGURATION: Gathered, but independent
MOVEMENT: Free
USUAL STORIES: 1

A marketplace serves as a hub where goods and services are traded. Typically located in the heart of a city, often at the traditional market square, these marketplaces feature small stalls where traders display their wares, and buyers peruse the merchandise. Despite its ancient origins, this form of retail continues to thrive worldwide.

These temporary stall structures offer flexibility and mobility, which appeals to owners due to their low operational costs. However, the small stalls usually have limited storage space, leading merchants to rely on off-site storage and preparation areas.

Marketplaces can take the form of open-air spaces or covered locations with stall-based setups (though not entire stores). In modern urban contexts, efforts are made to renovate and preserve these charming old marketplaces. Additionally, contemporary designs include permanent market stalls and rebuilt covered market halls, providing citizens with modern variations of these beloved markets.

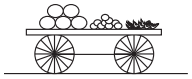
FEATURES



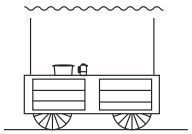
ABOVE: Several independent merchants with their stalls join together where the land is valuable and the customers can have access. Several smaller stalls make out the marketplace, which can be on the town square, on a side walk or more flexible stop-and-go markets at the high-way.

TO THE RIGHT: The sales area and stalls that are used at the market can vary greatly from place to place. From markets that are based on people selling their products directly from the street to more conceptual online marketplaces.

CARPET

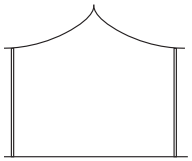


SIMPLE TROLLEY

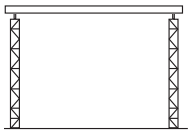


TROLLEY WITH ROOF

SIMPLE BENCH



TENT STRUCTURES



LIGHT STRUCTURES

INTERNET MARKETS

RETAIL MARKETS

STREET MARKETS

Architects: N/A
Location: N/A

The traditional street market varies from location to location, but one of the things they have in common is that the vendors usually are flexible and movable and that the outlets are easy to operate. Even though the sale outlets can vary a lot in design, they are usually a direct consequence of the available material and local construction skills and a response to the climatic challenges.

On an individual level they are also usually only serving as sales face of the business and can usually only handle a daily stock of supply. The market vendors are normally depending on additional independent space for preparation and production.

The configuration of the traditional markets doesn't follow one universal rule, but adapts to the appropriate and valuable pace, both in the local setting and in the bigger urban scale. Where a fixed store usually depends on location and the popularity of the given area, flexible market merchants have the possibility to relocate if this is profitable. This is only partly true however, since these markets, formal or informal, are usually forced to follow local or central jurisdictions.

Mercato del pesce al minuto, Venice. Source: authors.

A market place. Source: Freepik.

Mercato del pesce al minuto, Venice. Source: authors.

RETAIL MARKETS

MERCAT DE SANTA CATERINA

Architects:	Enrice Miralles Bendetta Tagliabue (EMBT)
Artist:	Toni Comella
Location:	Barcelona, Spain
Completed:	1997-2005
Use:	Fruit and vegetable market Parking Organic waste depository
Level of floors:	3

The Santa Caterina Market was built in 1848 and is the oldest market in Barcelona. In 2005 the entire market was renovated by EMBT Associated Architects and an iconic mosaic tiled arc roof designed by the artist Toni Comella were created.

The mosaics on the roof are colorful re-representation of the fruit and vegetable sold within the market. When seen from the street, it is the dominant vault shaped roof that is most prominent. In contrast to the exterior, the interior is designed with a focus on functionality and are allowing the merchants to work in more traditional surroundings.

The actual market place is situated on the ground floor and the two floors below function as a loading / unloading bay, along with parking and an organic waste depository for the surrounding area.

Mercat De Santa Caterina, Barcelona. Source: Wikimedia Commons, Fred Romero.

Mercat De Santa Caterina, Barcelona. Source: Flickr, Stijn Nieuwendijk.

RETAIL MARKETS

ROTTERDAM MARKET HALL
(planned opened in 2014)

Architects:	MVRDV
Location:	Rotterdam, The Netherlands
Use	Open market hall
	265 dwelling units
	1800sqm Supermarket
	3000sqm Retail area
	1600sqm Catering are
	1100 parking places

The new market hall and mix-use project in Rotterdam was designed by the Dutch architectural office MVRDV. Due to the new hygienic constraints of Dutch laws, the open-air market had to be covered, and in this case this demand was met by constructing a big roof consisting of 265 dwelling units.

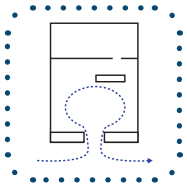
The Interior façade is planned covered with LED lights in order to create an ever-changing interior facade. “The front and back facades are made with a flexible suspended glass construction, allowing maxim transparency and a minimum of structure.” (Arcdaily). Situated in the centre of Rotterdam it is predicted to be one a new landmark for the Dutch harbor city.

Market Hall, Rotterdam. Source: Wikimedia Commons, Fred Romero.

Market Hall, Rotterdam. Source: Wikimedia Commons, W. Bulach.

Market Hall, Rotterdam. Source: GoodFon, Vitya Maly.

RETAIL STORES



C.1.2. RETAIL STORES

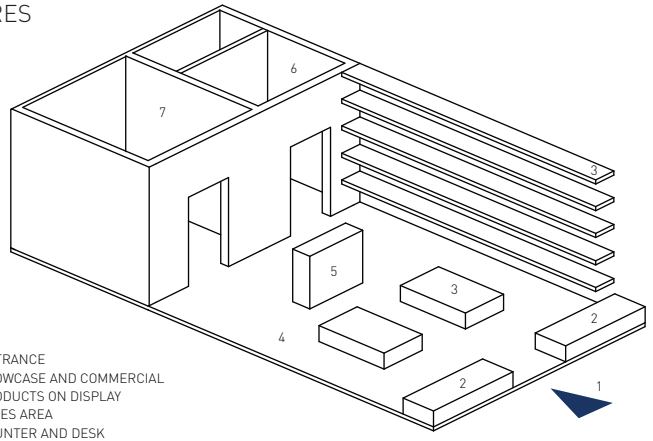
STRUCTURE: Permanent
CONFIGURATION: Independent
MOVEMENT: Free
USUAL STORIES: 1-3

Retail is the sale of something in general and a retail store is selling goods and services to the end-user. The retail store is a part of the supply chain and in contrast to the normal merchants at the market; the retailer purchases products in large quantities and sells to the consumer for profit.

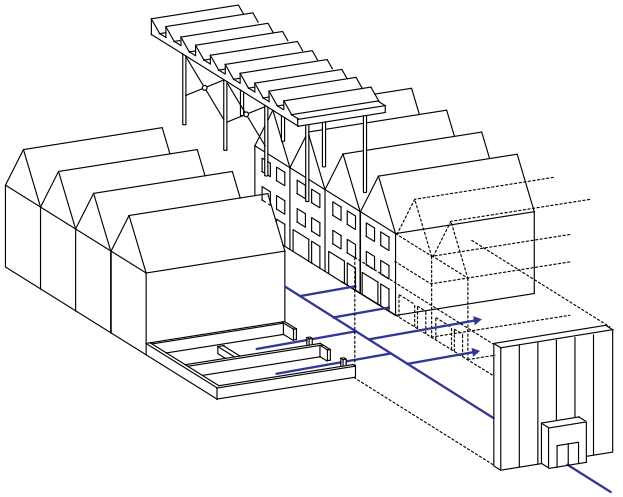
Retail can be done at markets, door-to-door or by delivery, but the normal retail shop is usually an enclosed shop with storage space, exhibition area and small additional spaces for operation.

The shops can be situated in everything from a residential streets to shopping streets and malls, but as during the last decades shopping has also become a leisure time activity, recreational shopping has lead to architectural design that focuses on the highest possible comfort for the consumer and not only on creating a functional trading space.

FEATURES



1 ENTRANCE
2 SHOWCASE AND COMMERCIAL
3 PRODUCTS ON DISPLAY
4 SALES AREA
5 COUNTER AND DESK
6 PRIVATE SERVICE ROOMS
7 LOCAL STORAGE



Several independent shops often join together and agree on covering an important street in order to compete with shopping malls by offering a higher standard of comfort in city shopping.This joint operation sometimes makes the independent shops more attractive to passers-by, and therfore potentially more valuable.

RETAIL STORES

BOEKHANDEL SELEXY DOMINICANEN (2007)

Architects:	Merkx + Girod
Location:	Maastricht, The Netherlands
Construction:	Original church:1294, Restored in 2007
Use:	Bookstore Coffee shop
Groundfloor:	750m2
Retail area:	1200m2

This bookstore is located inside a gothic church from the 13th century. The church has kept its original architecture and it has only been made small alternation to the decoration by adding independent bookshelves and supporting interior elements.

The multi-level bookcases are situated asymmetrically within the church in order to emphasize the original height of the room. On the left side of the black walk-in bookcase, the visitors can experience the impressive space, while on the other side they are directed to the upper levels of the retail areas. The architects explained that the bookcase was made so that it neither imposes on the space nor clashes with the church's architecture. The bookstore has gained worldwide recognition and beside winning the Lensvelt de Architect interior design award in 2007, the Guardian has announced it as "probably the most beautiful bookstore in the world."

Boekhandel Selexy Dominicanen, Maastricht. Source: Flickr, Jorge Franganillo.

Boekhandel Selexy Dominicanen, Maastricht. Source: Wikimedia Commons, FaceMePLS.

Boekhandel Selexy Dominicanen, Maastricht. Source: Flickr, Jorge Franganillo.

RETAIL STORES

CASANUEVA PHARMACY (2010)

Architects: Clavel Arquitectos
Location: Murcia, Spain
Use: Pharmacy
Retail floor: 180 sqm

The Casanueva Pharmacy is a renovation project that was done in order to meet the new rules and regulations given by the Spanish government and the new business concept that was imposed by the owners.

The refurbishment project had to be executed in only two months and the client stressed the importance of combining sales and building work the first period of implementation. In order to respond to this requirement the architect chose to prefabricate a maximum number of elements before the refurbishment started.

The big glowing sign that make up the main façade has become the identity of the project. The 3D letters are not only working as a commercial statement that makes the passers aware of the small shop, but are important due to their provision of solar protection to the shop's west façade.

Casanueva Pharmacy, Murcia, Spain. Source: Google Maps.

RETAIL STORES

APPLE STORE, Fifth Avenue (2006)

Architects:	Bohlin Cywinski Jackson
Location:	New York, USA
Use	Apple retail store

The Apple store at the Fifth Avenue was Manhattan's second Apple retail store and is open for customers 24 hours a day, 365 days a year. With its retail floor situated in the basement of the General Motors Building, the main entrance is located at the plaza level above. The only visible structure on the newly designed urban square, is the 32-foor structural glass cube and this main entrance brings daylight into the retail space during the day, while at night it becomes a glowing sign for the big store.

When the visitors enters the glass cube they are lead down the light glass stairs or the all-glass elevator. The interior of the underground store is designed with steel, stone and wooden showcases. After the opening in 2006, the store won several awards for its design including the Design Award from Business Week/Architectural Record Awards (in the same year) and the Award of Excellence for Design in by AIA New York State, the American Architecture Award by Chicago Athenaeum and the Award for Excellence in Architecture by AIA San Francisco in 2007.

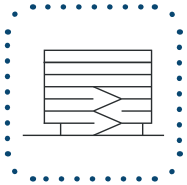
The iconic glass cube and subterranean glass staircase were trademarked by Apple in 2010 and have been, and will be, applied in several Apple stores all over the world.

Apple Store, New York. Source: Flickr, Jorge Láscar.

Apple Store, New York.
Source: Flickr, Dan Nguyen.

Apple Store, New York.
Source: Flickr, atmtx.

RETAIL
SHOPPING MALLS



C.1.3. SHOPPING MALLS

●●○○

STRUCTURE: Permanent
CONFIGURATION: Independent
MOVEMENT: Designed
USUAL STORIES: 1-3

A shopping mall is a place were products are sold and several outlets create an architectonic unit and have a type of joint operation.

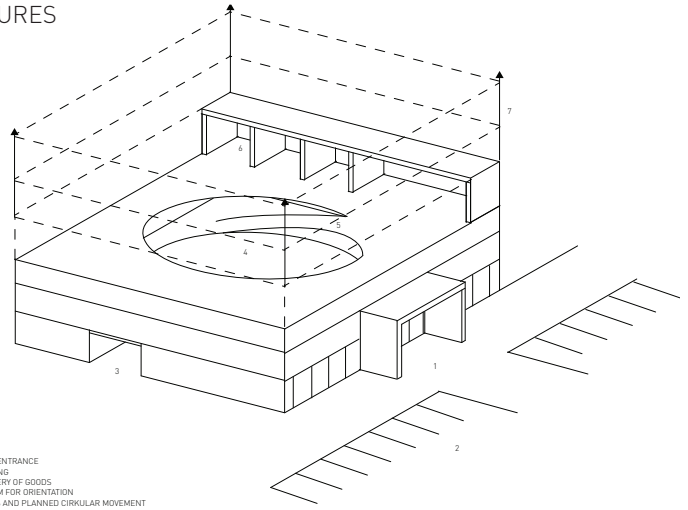
Much retail is based on impulse, and it is therefore dependent on the fact that the customers are exposed to as many products as possible during their visit. Many of the shopping malls are, for this reason, thus designed to "lead" people through the centre in a specific way. As a result of this planned movement, combined with good locations and the positive effect of it functioning as a gathering point, influences the user to spend a lot of money in the mall. An additional advantage of many modern malls is that they are designed to be social, public spaces, where modern shoppers can meet, hang-out and spend money during the whole day.

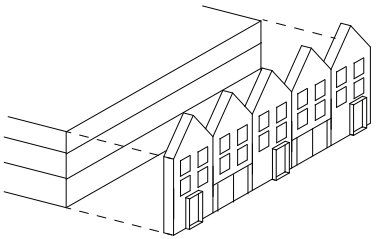
Shopping has, during the last decades, become a a hobby and recreation activity and for many users, it is convenient to use the mall due to easy access, it is easy to find parking, you have everything under one roof and you can find everything from cafes, foodstores, clothing, public services etc. For many people it is also important that the malls are easily accessible with wheelchairs and strollers and that you can do free indoor exercise (Mallercise).

Shopping malls are often categorised in three groups

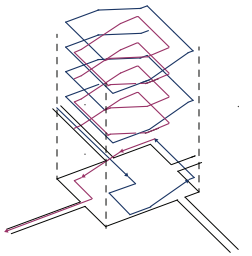
- Regional malls: Far out from the city centre, need car to access, dominated by big food stores and clothing brands
- District malls: Planned and made in combination with suburban development. In addition to big food stores and clothing brands, they usually include post offices, banks and health services.
- City Centre malls: Located in the city centre and is dominated by clothing brands, cafés, bars and restaurants.

FEATURES





In the city center several shopping malls try to adapt to the city fabric by copying or reusing the old buildings and/or facades. This creates the impression of a city consisting of several small retail shops while they actually can lead you into a big "hidden" shopping mall which can keep your attention for a whole day.



Circulation is usually an important part of the design and its goal is to lead the potential buyers into a space where they are exposed to as many products as possible. A usual system is a double-helifax stair system; if you first are going upwards, you have to take the long way down again.

RETAIL
SHOPPING MALLS

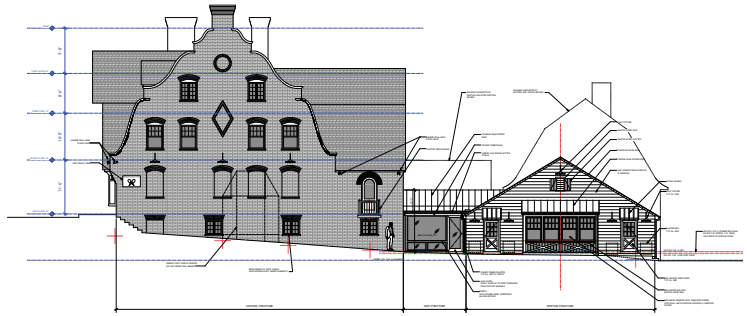
ROLAND PARK SHOPPING CENTER (1907)

Architect:	Wyatt & Nolting
Location:	Baltimore, Maryland, USA
Use:	6 stores
	Offices
	Apartments
	Community rooms
No. of floors:	1-3

Opened in 1907, Roland Park Shopping Center is credited as the world's first shopping centre. It is a single building strip of only 6 stores and was part of the first planned "suburban" area in North America. This suburban area was developed in the year 1890-1920 as an upper-class area by the architects Edward Bouton and Frederick Law Olmsted, jr.

The shopping centre was erected in English Tudor style and originally planned as an apartment and office building with community rooms for civic functions on the upper level and had parking space for both horses and wagons.

The idea of shopping centres first became really popular in the mid-1950s. At this time the urban sprawls had became bigger, people could afford cars and the fact that people owned their own coolers and refrigerators enabled people to buy food in large quantities.



RETAIL
SHOPPING MALLS

SOUTHDALE SHOPPING CENTRE (1956)

Location:	Edina, Minnesota, US
Architects:	Victor Gruen Associates
Developer:	Dayton Company (Target Corporation)
Use	120+ stores 5200 parking places Post office Small zoo Grocery store Food Court
Total retail floor area:	120 000 Square metres
No. of floors:	2-4

Southdale Shopping Center opened in 1956 and was the first fully enclosed, climate-controlled mall in the US. Today, several additions have been made, but much of the old structure is still in use. The architect of the centre wanted to create a „communal gathering place where people could shop, drink coffee and socialize.“ (Wikipedia). Originally, it was not meant to replace the downtown of Minneapolis, but be a more complete and better thought-out alternative. To accomplish this, he placed art pieces, decorative lighting, tropical plants and flowers throughout the mall.

Southdale Shopping Centre, Minnesota, USA. Source: Google Maps.

RETAIL
SHOPPING MALLS

GALAXY SOHO (2012)

Location:	Beijing, China
Architect:	Zaha Hadid Architects
Total Floor area:	332,875 m2
Plot area:	46,965 m2
	1275 parking places
	4 towers of 15 floors;
	12 office floors and
	3 retail floors
Height:	67 meters

The Galaxy SOHO project in Beijing is a modern Chinese office, retail and entertainment complex that was designed by Zaha Hadid Architects in 2009 and finished in 2012. The building consists of four towers, connected by bridges. The building has a continuous, fluid façade, an impression which is supported by the building not having a straight corner (www.dezeen.com).

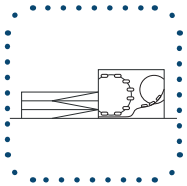
The building won a RIBA international award in 2013 for what the jury stated was "distinctly urban rather than suburban, civic as much as it is commercial" architecture. Even though the architect states that the building "reflects traditional Chinese architecture where courtyards create an internal world of continuous open space," the building itself has been openly criticized however, by Beijing Cultural Heritage Protection Center (CHP) for causing "great damage to the preservation of the old Beijing's streetscape, the original urban plan, the traditional Hutong and courtyards houses, the landscape formation and the style and color scheme of Beijing's unique vernacular architecture" (www.dezeen.com).

Galaxy Soho, Beijing. Source: Flickr, Rob Deutscher.

Galaxy Soho, Beijing.
Source: Flickr, Cory M. Grenier.

Galaxy Soho, Beijing. Source: Wikimedia Commons, Archillumi.

RETAIL
MEGA MALLS



C.1.4. MEGA MALLS

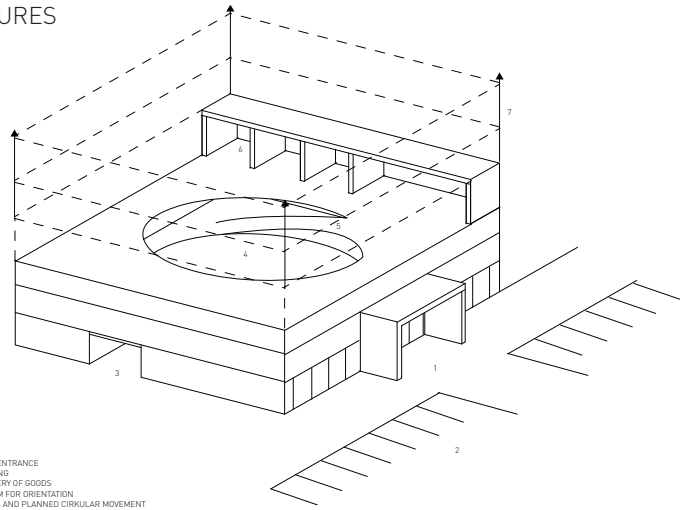
●○○○

STRUCTURE: Permanent
CONFIGURATION: Planned and designed
MOVEMENT: Planned
USUAL STOREYS: 3-6

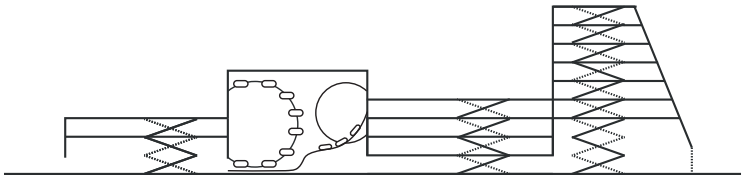
Mega malls could also be referred to as power centres, festival centres or super-regional centres and have a collective retail area above 10,000m2. These malls are collecting the big-bucks retailers, smaller shops, theme parks, food courts, public spaces, recreation areas etc., all under one roof and have learned from the smaller shopping malls when it comes to creating vibrant public spaces.

Normally the malls are located in the outskirts of the city and are extensions of smaller regional malls, but with the big variations in the program offered to the visitors. These malls are becoming small cities in themselves, even offering everything from hotels and apartments to cinemas, bars, grocery stores and smaller retail stores.

FEATURES



1 MAIN ENTRANCE
2 PARKING
3 DELIVERY OF GOODS
4 ATRIUM FOR ORIENTATION
5 STAIRS AND PLANNED CIRKULAR MOVEMENT
6 RETAIL STORES
7 ADDITIONAL PROGRAM, OFFICES, APPARTMENTS ETC



The mega malls are usually composed of several individual buildings, but with one connected circulation route.

RETAIL
MEGA MALLS

WEST EDMONTON MALL (1981)

Architect:	Maurice Sunderland
Developer:	Triple Five
Location:	Edmonton, Alberta, Canada
Use:	800 stores and services
	20000 parking spaces
	24000 employers
	32,2 million visitors
	World Waterpark
	Galaxyland amusement park
	Fantasyland Hotel
	Indoor shooting range
	Sea Lions Rock
	Indoor ice rink
	18-hole miniature golf course
	Ed's Rec Room Entertainment Park
	Movie theaters
Total retail floor:	350 000 square metres
No. of floors:	3

The West Edmonton Mall was the worlds largest mall until 2004, but is today, ranked tenth by gross leasable area. The mall was first constructed as a simple regional shopping centre, but it progressed from what was originally intended, from a simple mall into a billion-dollar mega-mall. The mall covers a property equivalent to 24 city blocks, „is over a mile long, and with its two floors has a floor area of approximately 480,000 square metres." (Proteus).

West Edmonton Mall, Edmonton, Canada. Source: Wikimedia Commons, IQRemix.

West Edmonton Mall, Edmonton, Canada. Source: Flickr, Edmonton Economic Development Corporation.

West Edmonton Mall, Edmonton, Canada. Source: Flickr, Arthur Chapman.

RETAIL
MEGA MALLS

MALL OF AMERICA (1992)

Architect:	Jon Jerde
Developer:	Triple Five
Location:	Bloomington, Minnesota, USA
Use:	530 stores
	Nickelodeon Universe indoor theme park
	NHL sized Ice Rink
	3 Hotels
	Dinner theatre
	40 million users
	12000 workers
	IKEA store
	SEA LIFE Minnesota Aquarium,
	Mini golf course
	Bowling alley and entertainment court
Total retail floor:	230 000 square metres
Gross area:	452 000 Square metres
No. of floors:	3-4

Upon its inauguration in 1992, the Mall of America emerged as the second largest shopping mall in the United States by total area and the largest in terms of the number of store vendors. It is among the most frequented shopping malls globally, attracting over 40 million visitors annually, which is nearly eight times the population of the state of Minnesota. Additionally, the Mall of America Transit Station has become the busiest station in Minnesota, providing bus and metro services that connect the mall to numerous destinations across the state.

Mall of America, Minnesota, USA. Source: Wikimedia Commons, Runner1928.

Mall of America, Minnesota, USA. Source: Flickr, Meet Minneapolis.

RETAIL
MEGA MALLS

DUBAI MALL (2008)

Architect:	DP Architects Pte Ltd.
Location:	Downtown Dubai, United Arab Emirates
Use:	1200 shops 635 retailers 120 restaurants and cafes 140000 parking spaces 250-room luxury hotel Dubai Aquarium and Underwater Zoo Ice Rink that can host 2000 guests SEGA Republic theme park 22 cinema screens and more than 2800 seats
Total retail floor:	502 000 square metres
No. of floors:	4

The Dubai Mall, situated in Dubai, United Arab Emirates, holds the title of the largest shopping mall in the world by total area. With 1,200 shops and an internal floor area of 550,000 square meters, it opened on November 4, 2008, marking the largest mall opening in history. By 2012, it had become the most visited shopping and leisure destination globally, attracting over 65 million visitors and surpassing popular spots like Times Square (39.2 million), Central Park (38 million), and New York City (52 million).

Dubai Mall, United Arab Emirates. Source: Wikimedia Commons, Edgar El.

Dubai Mall Grand Atrium, United Arab Emirates. Source: Wikimedia Commons, Håkan Dahlström.

Dubai Mall, United Arab Emirates. Source: Wikivoyage, Eigenes Werk.

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Concept drawings and pictures to chapter C.1 belongs to Aleksander O. Jensen

C 2. GAS STATIONS

This chapter will try to describe the past, the present and the future of the gas station typology.

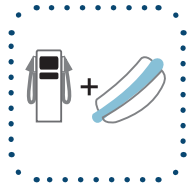
The gas station, and its history, cannot be studied as an isolated object, as it is inseparabely linked to the concept of the car and the history of human transportation. It would be meaningful, however, to rationalize the concept of the gas station in order to see how it finds its place in modern city and urban planning, and especially how it can adapt to the future.

The first gas station was established in Germany in 1888, as a direct result of the industrialization of car production in the late 1880s. The first gas stations were actually organized as side businesses for pharmacies, and were typically small roadside structures, or even just free standing gasoline pumps located within the city fabric.

The first purpose-built gas station was constructed in the U.S. in 1905.

THE EVOLUTION OF THE GAS STATION

The history and the physical morphology of gas stations and their functions cannot be seen separately from that of the car and the rise of the consumer society. Gas stations, have since the very first editions, been key to the success of the car, the consumption of oil and hence the fuelling of the oil economy. Their concept and physical shape have evolved through the different phases of the last century. Following is a brief, abstract explanation of the conceptual evolution of the gas station, examplified from Norway / northern Europe.



C.2.1. GAS STATION + SERVICE

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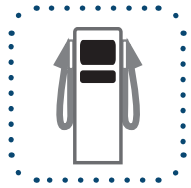

C.2.2. STAND-ALONE FUEL SUPPLY

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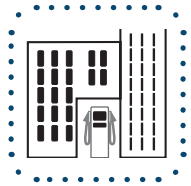

C.2.3 URBAN ADAPTATION

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C COMMERCIAL BUILDINGS

C 2. GAS STATION

C.2.1. GAS STATION + SERVICE

C.2.2. STAND-ALONE FUEL SUPPLY

C.2.3. URBAN ADAPTATION

GAS STATIONS' EVOLUTION

Photo 1: Melaina, Marc W., "Turn of the Century Refueling: Lessons from the Past for Introducing Hydrogen Fuel for 21st Century Refueling," Presentation at the 15th National Hydrogen Association (NHA) Annual Conference, Los Angeles, CA, April 26 – 30, 2004.

ON SEPARATE SITES:
(1920´s and onwards)

The demand for more gasoline and more and better service facilities for car maintainance grew dramatically throughout the 1920´s. The gas filling stations required more land area, and hence the gasoline companies bought their own sites to set up filling stations.

Photo 2: Diamond Gas station by Thomas Little, 1961. Georgia, US.

FROM CITY CENTRE TO DISTRICT:
(1950´s and onwards)

Through the 1950´s and 60´s the number of privately owned cars increased dramatically, relatively speaking. This created an even bigger need for gasoline and service functions, and hence more land area. The locations of the gas stations tend to shift from the city centre to the outskirts of the cities or the surrounding districts.

THE CURB PUMP
(1890 - 1920)

To begin with, the gas stations were typically stand-alone pump structures on the curb on strategic locations in the city fabric. These were usually under control of a pharmacy or a paint - or hardware store, and had little or no service functions for cars and their users besides the gasoline itself.

THE SERVICE STATION
(1930´s and onwards)

Following the shift in foucus from offering only gasoline to providing a variety of services for cars and their users, the gasoline filling station as a service station became more or less institutionalized during the 1930´s. A distinct gas station architecture emerged.

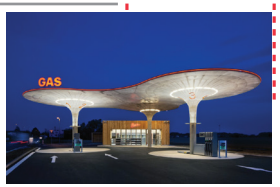


Photo 3: Gas station by Atelier SAD, 2011. Galanta, Slovakia.

GAS STATIONS
FROM A PLANNING PERSPECTIVE

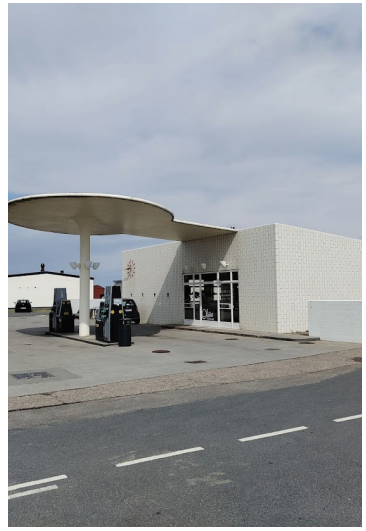
The car's impact on urban planning, in terms of what influence the use of cars should have on the actual urban layout, is at best debatable. It seems to vary from country to country, from culture to culture and especially over time.

To many of the great modernists, the car was supposed to be the very pivot point of our daily life and routines, and dramatic, large-scale plans were drawn accordingly. Maybe the most clear-cut examples of such car-dependent city plans exist in the U.S, where many cities are not planned for pedestrians at all.

Cities all over the world are now struggling with legacies of the generic, car-friendly plans laid out in times when the rapidly expanding use of cars seemingly brought only benefits, and no concerns.

Regardless of good intentions and the ever-lasting pursuit of more eco-friendly and sustainable planning, many (if not most) planners and urbanists believe that the car has come to stay. The discussion should not be then on how to eliminate the use of cars, but rather how to make the car itself more environmentaly friendly, limit our need for cars and develop the sustainable integration of car use in city planning. All this said, gas stations are also here to stay. The question that remains is what the gas station of tomorrow will look like.

The gas station faces, as already mentioned, many challenges in order to be successfully integrated into denser urban situations. First of all it has to cope with the immense volume of liquid fuels that pass through the fuel reservoirs every day. This problem will hopefully be limited or even eliminated by the development of combustion engines consuming far less fuel, or even the successful integration of new, sustainable and renewable energy sources. The latter will happen sooner or later, but it will probably take years, if not decades, to change our use of fossil fuels and hence the global oil economy into something more sustainable. So, even though more sustainable fuel types and technologies are made available every year, gas stations with a high turnover of liquid fuels will probably be present for years and years to come.



Gas station by Arne Jacobsen, Charlottenlund, Denmark. Source: authors.

Gas station by Arne Jacobsen, Charlottenlund, Denmark. Source: authors.

The second major concern when thinking of integrating large reservoirs of extremely flammable liquids into dense urban settings, is of course fire hazard. Fire prevention is a major concern, even when gas stations are located on vast, open fields, and hence presents a real challenge in a city setting.

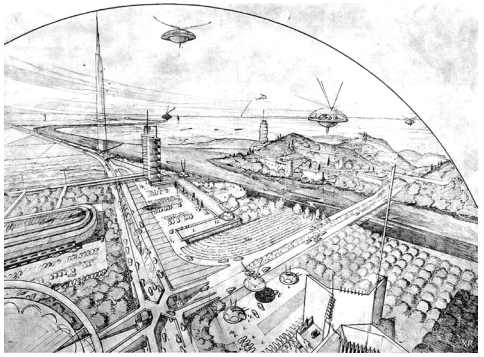
The third challenge is somewhat more complex, and is related to both our perception of- and expectations for a gas station, which in turn is closely linked to how the gas station business is set up and operated. In Norway, for instance, the gas or petrol itself is not a really lucrative product to sell, as the profit margins are slim. What really makes a Norwegian gas station big business is everything that comes with the petrol. Convenience store products, groceries, restaurant meals, car wash, car care products and all kinds of service functions are always within close range when you stop to fill up the tank.

In many communities the services and products offered at the local gas station are important. The gas station itself might even be a center point in the community. In dense cities, however, the gas station has to compete with all the other products and functions offered in the urban scenery. Hence the locality of a gas station should, as with most other businesses, be decisive for what kind of concept it is built upon, both physically and economically. But is it?

In smaller cities most gas stations are usually located outside the city core, or in the suburbs. The travelling distance required to reach a gas station is probably affordable, and many inhabitants in the city core may not possess a car at all.

When cities grow, hovewer, gas stations sooner or later need to find locations within the boundaries of the urban sprawl. This is when the gas stations need to react to their localities and adapt to a denser future.

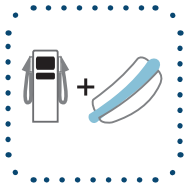
Through studying the gas station typology one can easily get the impression that there has been a stand-still in the development of gas stations, both as objects and as a typology. The development seems to be restricted to materials, physical expression and technology, and not contextual concepts. One could say that the gas station we know today was designed for a different era - one of few concerns and endless possibilities.



Frank Lloyd Wright´s "Broadacre City". Source: Flickr, James Vaughan.

Myklegard: Local community centre including gas station, restaurant, motel, car wash and parking, Hedmark, Norway. Source: Google maps.

GAS STATION + SERVICE



C.2.1 GAS STATION + SERVICE

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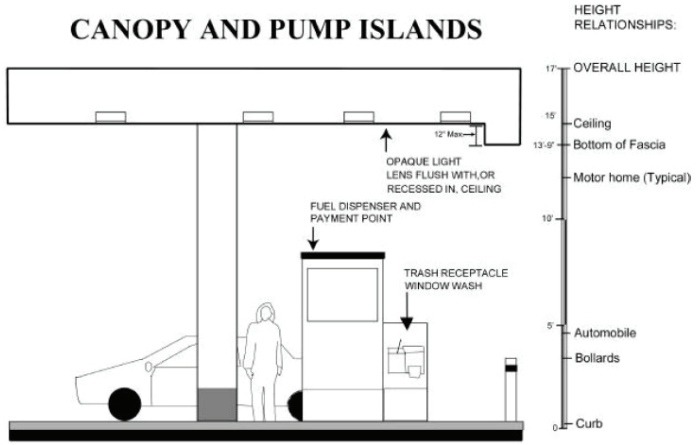
TYPOLOGY: Typical gas station of today
CONNECTION SYSTEM: ramps (straight and helicoidal)
The solutions are completely standarized in patents

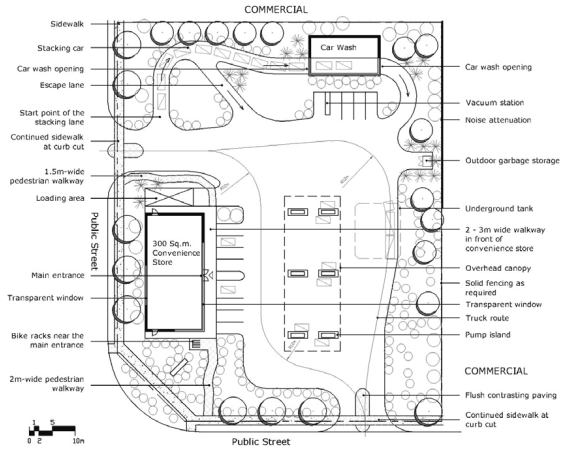
The typical gas station of today is easily recognizable, as its typology and physical appearance has been more or less institutionalized over the last 60-70 years.
As a general concept, the typical gas station has an immediate proximity to a main road or a highway and has a big paved parking and circulation area, some of which is sheltered under a steel-structure canopy. The actual gas pumps are located under the canopy, and a convenience store lies either directly besides the canopy or with a gap between.

Illustrations on this page show a schematic gas station layout drawn by the planning department of the city of Iowa. On the following pages is a selection of newer gas stations from different parts of the world, considered (by the architectural community) to be architecturally significant. These are displayed here to highlight which functions and elements that are recognized as important to a modern gas station. Notice that they all have the same basic setup, they all take up a lot of ground space, they are all in a rural or suburban area, and that they can all be seen as detatched objects in the landscape.

FEATURES

BASIC SECTION





Disclaimer: The sketches/images/drawing/pictures used on this particular page are for educational purposes only and they are property of the represented office/authors.

GAS STATION + SERVICE

Ever since the first gas and service stations were erected in the 1930's, it has been lucrative business for them to offer groceries, convenience store products and different services to people coming to fill up on gasoline. Over the years this has become inseparably linked to the concept of the modern gas station, which today can be described as combined convenience store and a restaurant which happens to have one or more gas pumps under a steel canopy near the road.

When discussing the gas station typology this needs to be addressed, as it makes the whole typology topic more complex. One cannot think of all future gas stations as merely a gas pump, at least not in the rural or suburban areas.

This trend obviously has economical and business related origins, and is now part of our commercial culture. In Norway, gasoline companies are marketing their gas stations by branding different restaurant and grocery concepts, and not by advertising the price of the actual gasoline. This in turn gives the modern gas station concept even stronger socio-cultural roots, making the typology more robust.

Junk-food is big business in gas stations. Picture from Statoil Gas station: Strømstad / Sweden.

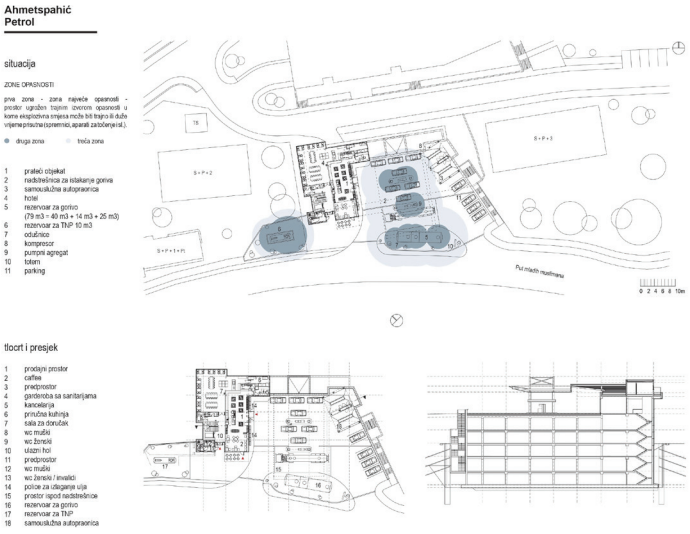
Esso Gas Station - On The Run store brand. Source: Wikimedia Commons, Stickguy.

Advertisement for Esso's "On The Run" concept.

GAS STATION + SERVICE

AHMETSPAHIĆ PETROL (2017)

Architects: Sabrija Bilalić
Location: Put mladih muslimana, Sarajevo
Use: Gas station and service + aparthotel
Concept: The placement of this gas station is very unusual because it is built on the roof of a hotel with an access to a nearby transit road. This concept was derived from the unique terrain conditions with significant difference in height between the ground floor and the roof which is 5 floors. This gas station consists of a shop with coffee and self-service car wash.

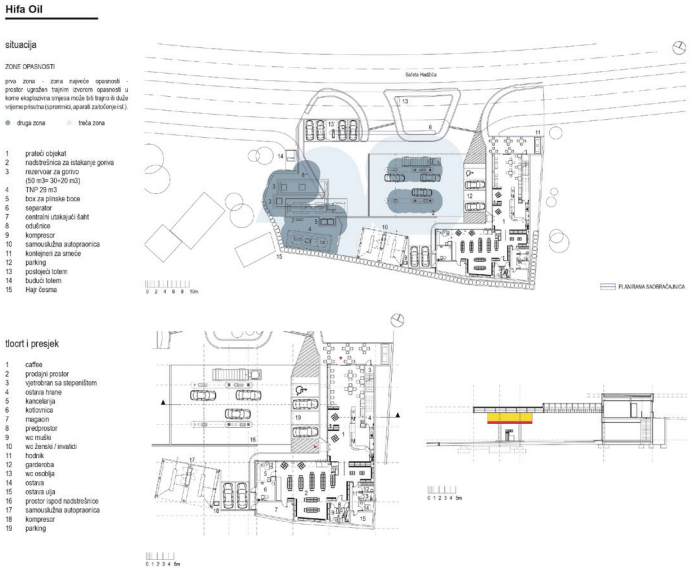


Gas station "Ahmetspahić Petrol", Sarajevo. Source: Sabrija Bilalić

GAS STATION + SERVICE

HIFA OIL (2017)

Architects: Sabrija Bilalić
Location: Safeta Hadžića (Švrakino selo), Sarajevo
Use: Gas station and coffee station
Concept: A complex building designed for its brand's needs, consisting of two levels; level one – gas station area, gift shop, cafe area, and level two – administration office. The architect wanted to achieve connection between building design and nature by using natural materials combined with brand design colors and modern materials. Also, the location of this complex is a very steep slope, which emphasises the idea of a building emerging out of the hill.

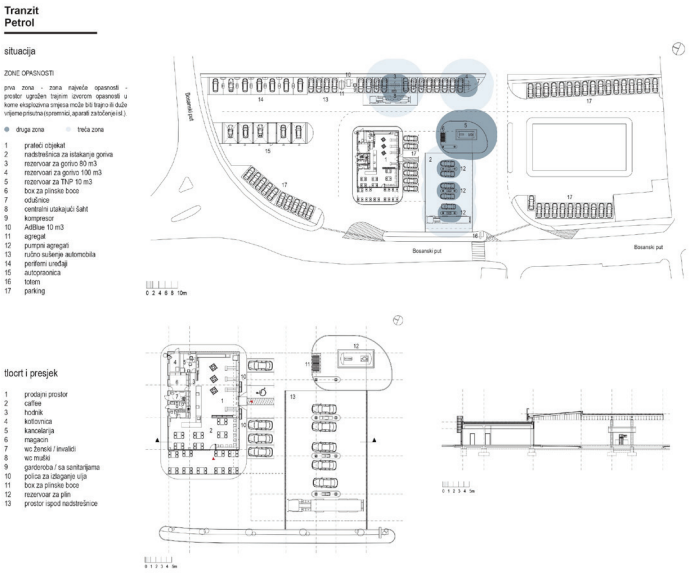


Gas station "Hifa Oil", Sarajevo. Source: Sabrija Bilalić

GAS STATION + SERVICE

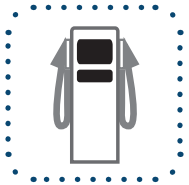
TRANZIT PETROL (2017)

Architects: Sabrija Bilalić
Location: Bosanski put, Ilijaš
Use: Gas station with carwash service
Concept: This building consists of few different service areas – gas station, shop area, a coffee shop, parking area and a carwash. Because of its horizontal and vertical size, and as well as its location – by a regional road, this building is both easy to spot from afar, and easy to enter.



Gas station "Tranzit Petrol", Ilijaš. Source: Sabrija Bilalić

GAS STATION
STAND-ALONE FUEL SUPPLY



C.2.2. STAND-ALONE FUEL SUPPLY

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TYPOLOGY: Stand-alone fuel supply
LOCATION: Worldwide

URBAN CHALLENGES

The present physical concept of the gas station demands vast areas of land, making them difficult to integrate into dense urban landscapes.

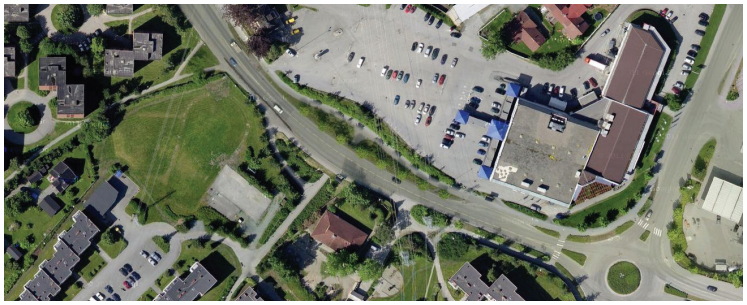
- The extreme fire hazard associated with liquid fuels makes gas stations less desirable anywhere else than in open areas.
- Gas stations (obviously) generate large volumes of car traffic, effectively limiting appropriate locations in city areas.
- Large volumes of car traffic generates pollution in terms of gas emissions and particles.

The centralized mix of different space-consuming service functions required in a successful gas station makes it less desirable in dense urban situations, as in many cases it cannot compete with the typical decentralized urban facilities.

UNO X GAS PUMP

Architects: unknown
Location: Moholt/Trondheim, Norway
Use: stand-alone fule pump on existing parking lot
Company: Uno X

This gas station is a stand-alone pump structure, offering nothing else than gasoline. It is situated in an existing parking lot in front of a grocery store in Moholt / Trondheim, Norway.



Uno X gas Pump, Moholt/Trondheim, Norway. Source: Google Maps.

GAS STATION
STAND-ALONE FUEL SUPPLY

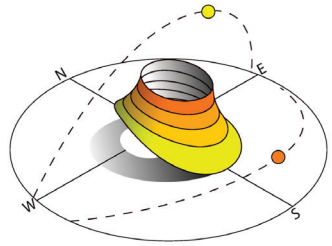
PLUG + PLAY
(2012)

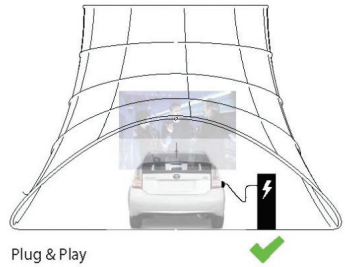
Architects:	HMMY
Location:	Conceptual
Use:	Fuel supply only
About:	The winning proposal for a charging station for electric vehicles

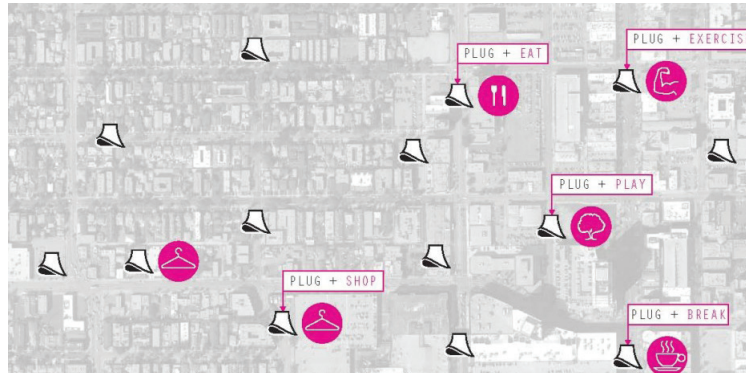
FROM THE ARCHITECT

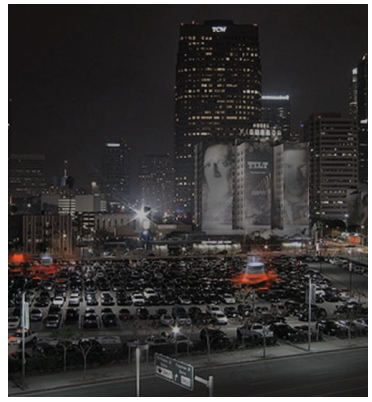
"Our project challenges the conventional centralized electric charging station typology, proposing a decentralized, modular system which "plugs in" next to 30 minute activity (play) zones throughout the urban context, taking full advantage of the 30 minute charge time for most electric vehicles. This model is facilitated by the size of the unit - fitting neatly into two adjacent, standard parking spots. Any extra energy generated by the photovoltaic panels on the "plug+play" surface feeds back into the local energy grid." (HMMY)

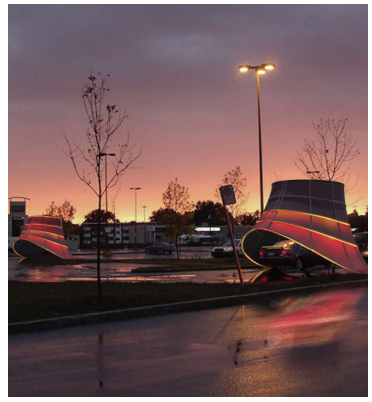
The concept of this filling station is a modular electric recharging station, which, with its photovoltaic surface, in fact functions as a big solar panel, creating pure, renewable energy for electric vehicles. The size of the conceptual module frees it from the traditional, centralized gas station typology.




Plug & Play







GAS STATIONS
URBAN / HIGH DENSITY CONCEPTS

This study will not try to elaborate the future of the typical gas station in suburban or rural areas, as it's present form has strong social and economical ties to car culture and is significant to local communities. More interesting, probably, would be a brief look into different approaches on how to integrate the gas and filling stations of the future into our ever expanding cities. When studying the topic, it turns out that there are remarkably few variations from the space-demanding, typical gas station layout. There are, however, some examples. The basic concepts are as follows:

1ST FLOOR INFILL
AN URBAN VARIATION

This concept also often comes with the same functions as the typical gas station. The difference is that it´s located on the first floor of a building in the city structure, connected to a main road. Also in this case the plot size is reduced by minimizing parking and circulation space.

SAME CONCEPT
- SMALLER PLOT SIZE

This general concept is based on the typical gas station layout with convenicence store, resaurant, car wash and so on. It has a smaller parking and circulation area to adapt to a smaller plot. In some examples the actual gas pumps are suspended from the roof or canopy to eliminate pump islands taking up ground space.

THE UNMANNED
GAS STATION

This is basically half of the typical gas station, including only the canopy over a circulation space with self-operated pumps. By eliminating the convenience store, the ground space needed is somewhat reduced.

DECENTRALIZED NODES
STAND-ALONE FUEL SUPPLY

The only solution which is not merely a reorganization of the century-old traditional gas station concept. Instead of a whole package of different services in addtition to gas, this solution offers only fuel - leaving the other services and products to other urban vendors. This concept is similar to the unmanned gas station, but has little or no dedicated circulation and parking area.

GAS STATIONS
URBAN ADAPTATION

C.2.3. URBAN ADAPTATION

TYPOLOGY: Urban gas station
LOCATION: Worldwide
YEAR: 1940-

URBAN CHALLENGES

- The present physical concept of the gas station demands vast land area, making it difficult to integrate into dense urban landscapes.
- The extreme fire hazard associated with liquid fuels makes gas stations less desirable anywhere else than in open areas.
- Gas stations (obviously) generate large volumes of car traffic, effectively limiting appropriate locations in city areas.
- Large volumes of car traffic generates pollution in terms of gas emissions and particles.

The centralized mix of different space-consuming service functions required in a successful gas station makes it less desirable in dense urban situations, as in many cases it cannot compete with the typical decentralized urban facilities.

"1st floor infill": City integrated gas station: Alexander Kiellands Plass, Oslo, Norway. Source: Googla Maps.

Same concept - Smaller plot size: City-integrated gas station: Tokyo, Japan. Source: Googla Maps.

GAS STATION
URBAN ADAPTATION

R.W. LINDHOLM SERVICE STATION
(1956-58)

Architect:	Frank Lloyd Wright
Location:	Cloquet / Minnesota, USA
Use:	Fuel supply, service and community catalyst
About:	Service station concept from the utopian project “Broadacre city”

“Watch the little gas station... In our present gasoline service station you may see a crude beginning to such important advance decentralization; also see the beginning of the future humane establishment we are now calling the free city. Wherever service stations are located naturally these so often ugly and insignificant features will survive and expand. The new city is all around us in the haphazard making, the apparent forces to the contrary notwithstanding. All about us and no plan. The old order is breaking up...”
(Frank Lloyd wright, 1930.)

In his utopian vision called “the Broadacre City”, Frank Lloyd wright describes a de-centralized American urban landscape. This particular gas station is the only part of his Broadacre designs that was realized.

Wright viewed the gas station as a “catalyst” which would help transform different communities into something like the Broadacre City. The service station would be “the future city in embryo” as Wright himself put it, or would “naturally grow into a neighborhood distribution center, meeting place, restaurant... or whatever else is needed” (Theatlantic).

Lindholm Oil Company Service Station, Cloquet, USA. Source: Wikimedia Commons, McGhiever.

Lindholm Oil Company Service Station, Cloquet, USA. Source: PICRYL

GAS STATION
URBAN ADAPTATION

CONVERSION OF MIES VAN DER ROHE GAS STATION
(2011) Source: Google Maps

Architects:	Mies van der Rohe / Les architectes FABG
Location:	Québec, Canada
Use:	former prototypical gas station, now community centre
Company:	Standard Oil

This example is included to show the spatial potential released if existing gas stations become vacant. The typical gas station's physical structure makes it, with some ingenuity, ideal for transformation, as in many cases it has great spatial flexibility. The example shows an iconic Mies Van der Rohe gas station in Quebec, Canada, transformed into a community centre.

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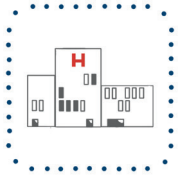

With the advances in medicine, mortality rates have decreased dramatically when compared with the last century. At the same time, life expectancy, has almost doubled (to around 70 years), since the beginning of the 20th century (Rose, Ortiz-Ospina, & Ritc, 2019). In such a setting, people in a majority of countries retire only at the age of 65 and in general, benefit from the better quality of life. Before the discovery of penicillin, people were dying from bacterial infections which are considered trivial today. With the aid of vaccines, some of the most devastating viral infections have been prevented and diseases such as smallpox have been eradicated[2]. Scientific discoveries have improved the ways of diagnosing illnesses (such as CT-SCAN or MRI) and those discoveries have been used in the pharmaceutical industry to create new medicines and improve existing ones. All this has led not only to an increased demand for pharmaceutical factories, medical/health buildings, but also for retirement homes or residence for the elderly.

HOSPITAL

Based on estimates, by the year 2080 there will be an increase of 151 million people over the age of 65 in the total EU-28 population (HOPE, 2018, p. 6). Accordingly, there will be 66.1 million people of the age 80 and over, based on the same source. The significance of these numbers is that all these people are likely to use medical facilities and therefore the capacities of existing hospitals will have to grow and new ones will have to be built. When designing hospitals, there are several factors to take into consideration. Historically, hospitals were linked with religious and military functions (Prasad, 2012). If we consider BH alone, we can observe the same evolutionary process as in other parts of Europe. Roman military barracks had medical stations that were copied as a model for the first hospitals. Those in Europe who had access to education and hence medical knowledge, were usually the priests, who were also skilled in preparing drugs. The 700-year-old Old Pharmacy in the Franciscan monastery in Dubrovnik, Croatia, is supposedly the third oldest in the world (Franjevački samostan Male braće, 2023). Mariastern, once the largest monastery of the La Trappe order of the Catholic priests (Lat. Ordo Cisterciensis Strictioris Observantiae), was founded more than 150 years ago near the city of Banja Luka in BH and it had a school and hospital dedicated to the public. However, the introduction of the public healthcare system in BH began over 100 years ago, in 1923 (Zavod za javno zdravstvo FBiH i Institut za javno zdravstvo RS, 2013). If one compares the two medical centres from the two cities where authors live and work, we can see how much has changed over the course of 100 years. The University Clinical Centre in Sarajevo has been rooted to the middle of the 19th century and major extensions were done during the Austro-Hungarian empire (1878-1918). Although it houses many modern clinics now, the disposition is based on the pavilion system established at the very beginning. Shifting patients from one building to another, even when using underground tunnels, proves to be a straining task for personnel. But, moreover, the concept where the “sick people” are placed in a contained area surrounded by the fence is an outdated model, if we compare it to the University clinical centre in Trondheim. There, clinics are part of the urban fabric of the city where people have full access to the pedestrian zones yet all the connections to the different buildings are done via pedestrian bridges on the first level.

Sarajevo University Clinical Center, Sarajevo.
Source: Authors.

St. Olav’s University Hospital, Trondheim.
Source: Authors.

2 since 1980 (Communicable Disease Center (CDC), 2017)

HEALTH CENTRE

If one compares hospital designs to hotel designs, there are lots of similarities between the two. They are both designed to house large numbers of people. Whereas in hotels, there are typically 50, 100 or 150 and more rooms, in hospitals accommodation is organised within wards of 40 beds (depending on the health standards). In such instances, where lots of accommodation space is needed with access to natural light, buildings are organised in linear, radial or centralised (rectangular) configurations. Other functional groups are then linked between to form specific zones. Hospitals are one of the most complex buildings to design, not only from the organisational point of view but because of the installation of neccessary systems (independent HVAC systems, installations for medical gases, medical waste disposal, etc.). Hospital typologies are well documented in the architectural profession and for this reason they are only briefly mentioned here. Further references on *"how they are born and evolve, about the forces that give them shape, and the shifts that conspire to render them inadequate"* (MURPHY & MANSFIELD, 2021) can be found in the selected publications (Battisto & Wilhelm, 2020).

Health Centre, Trondheim. Source: Openverse

Book Cover "The Architecture of Health". Source: SHOP Cooper Hewitt

Book Cover "Architecture and Health: Guiding Principles for Practice". Source: Amazon

RESIDENCE FOR THE ELDERLY

In many cultures, caring for the elderly within ones' own home together with the rest of the family, is part of life. Grandparents, while still able, usually take care of the grandchildren while parents are at work and in a way become viable substitute for kindergartens. In many communities this model of (traditional) living is still in place and admitting elderly members of the family to a nursing home or residence for the elderly, is not seen favourably by other community members. However, with the shifts in traditional ways of living and workings, where women are no longer housewives (but have many more obligations) and children are admitted to universities far away from their hometowns, there is practically no one to look after the ageing members of family. In such scenarios, the only viable option is to seek available accommodation in a residence for the elderly. Just as it is arguable, in terms of the benefits of socialising with the same age group, for placing children in the kindergarten vs staying at home with the grandparents, the same dilemma over the benefits applies to accommodating the elderly in specific residences. These residences have a number of advantages and for many offer a better quality of life, just on account of available facilities, individual and group assignments, socialising options, and available medical attention. From the architectural point of view, these residences are a combination of houses, hotels and hospital rooms where the most important aspects to consider are: movement of the inhabitants (access for the disabled) and safety features to prevent the most commonly occurring accidents, such as flooding and fire. Rows of rooms with the access to the ground floor and gardens (such as in single-family houses) are most favourable but, due to available land constraints, there are also examples of rooms organised in a "hotel like" manner with several stories. A representative example of a retirement home that had both of the mentioned characteristics is the retirement home in Nedžarići, in Sarajevo. Unfortunately, due to severe devastation during the war in the 90's, it was never reconstructed and due to its premium building location, likely plans are to reuse land for business or residential purposes.

Residence for the elderly, Nedžarići, Sarajevo (before and after war).
Source: Authors

D HEALTHCARE BUILDINGS

D 1.
HOSPIT

D 2.
HEALTH CENTRE

D 3.
RESIDENCE FOR THE ELDERLY

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Government Buildings

Every sovereign state rests on three pillars of security: support against external threats (guaranteed by its army), internal threats (guaranteed by the police) and equally important is the third pillar, justice (implementation of the laws guaranteed by the courts).

E.1 CITY HALL

E.2 COURT HOUSE

E.3 POST OFFICE

E.4 FIRE STATION

E.5 POLICE STATION

E.6 PRISON

E GOVERNMENT BUILDINGS

Military expenses account for a significant portion of a country's GDP and in 2020 it accounted for 1,56% (at 232,81B US$) for the entire European Union.(Macrotrends, 2024) Some 60 years ago, those expenses were at 13.52B US$ but at the that time it amounted to 3,82% of the GDP (World Bank Group, 2024). In terms of building procedures (planning, zoning, etc.) military infrastructure is rarely examined, in comparison to civil. They are "covered" by a veil of secrecy and since many procedures are carried out on a "need to know basis", there is not much publicly available data. A very good example of such case was the construction of the underground Željava Airport (at the border between BH and Croatia), or the slightly less expensive atomic shelter named ARK D-0, built near the town of Konjic in BH. Its construction lasted for decades (from 1953 until 1979) and according to some estimates its cost was 4.6 billion US$ (Bunker, 2024). The general public was unaware of the existence of such buildings, whilst workers were brought to site in such manner that they were unaware what was being built or even where it was built. Only in the 1990s, it had become known what was hidden in the mountains of BH. Today, this facility serves as an exhibition place and many artists have exhibited their works in one of the safest places on earth.

ARK D-0 Konjic (Tito's bunker), BiH. Source: Wikimedia Commons, Boris Maric.

It is very difficult to conduct research on military buildings without fear of being questioned for possibly exposing military secrets and for that reason not much is accessible. Therefore, the following chapters deal exclusively with civilian infrastructure.

Government buildings are in essence, office buildings, where most of the work is of the "desk job" type. This is why the layout of the buildings varies to allow maximum daylight exposure and at the same time provide a certain degree of privacy. One interesting approach was the redesign of Germany's Parliament building – the Reichstag in Berlin. It's new glass dome structure has mirrors that swivel down, looking through the ceiling of parliament assembly. With this feature, the message of transparency of politician's work is strongly conveyed, with the note that they are observed by the people – all the time. Government buildings – depending on their significance, may have special requirements in terms of security, such as a protected perimeter, tinted windows for privacy or enhanced fire safety features.

Reichstag, Parliament building, Berlin.
Source: Wikimedia Commons, Ansgar Koreng.

CITY HALL

In the traditional European town setting, two buildings dominated the landscape. First would be a church or cathedral and the second one was the town hall. Usually, the first building or its towers were the reference point, and should no building should be higher. This rule carried a certain message: religion (sacral) is above the profane (everything else). This was as to state that the government and town leaderships will change quite often yet the religious buildings stand still as the anchor to society. This "tension" can still be seen in many cities and in the case of capital of BH two points can be made. First was the construction of the city hall in Sarajevo in the late 19th century after the Austro-Hungarian occupation, and the building itself dominated the urban landscape. Placed in the existing urban fabric where shops hardly ever reached above two floors, and where the mosque was the measure of size and might, the new town hall overlooked its neighbouring buildings. This was for sure a statement of power, expressed in the form of a building, i.e. the city hall from where the important decisions would be made. Years after, this "influence" decreased, and many other taller buildings were erected. Eventually, in another part of the city, where government buildings had dominated the view for decades, new shopping malls and hotels where constructed and this too can be seen as another "shift of power". Therefore, a second point can be made: seeing those commercial buildings overlooking government building, might be translated into the statement that the money is a real governor of things and politicians are there only as a necessary means to an end – to conduct the decisions made by those who have the real power.

Sarajevo City Hall, BiH. Source: Authors.

Vienna City Hall, Austria. Source: Flickr, Reading Tom.

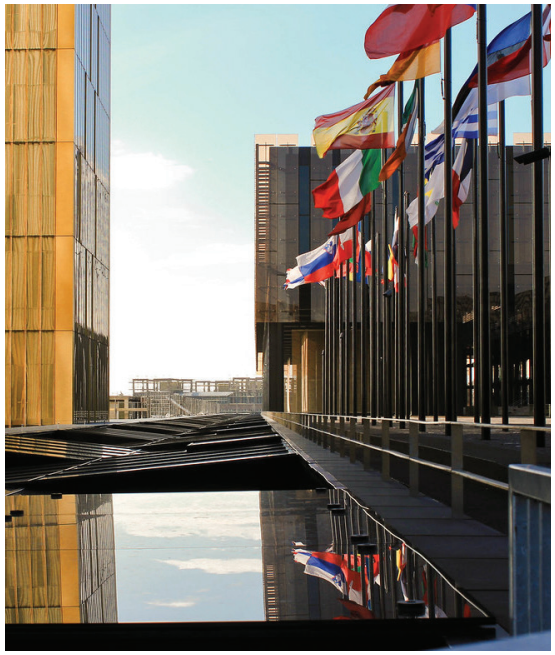
COURT HOUSE

A trustworthy legal system is the backbone of every successful nation and, along with a stable political system it offers economic prosperity (Acemoglu & Robinson, 2012). This statement, which summarises the impact of the stable legal system's effects on a nation's development and state of affairs, emphasises the importance of upholding the laws. So, what happens when country goes through a transition from one political system to another? So many examples can be drawn from the case of BH and unfortunately not many are favourable. The introduction of Anglo-Saxon legal procedures alongside Roman law as a foundation, in many cases proved to be unlikely combination, frequently causing prosecutors to fail in their task. People often see the protagonists of the high-level court cases walk free from the charges and over time, faith in legal procedures grows weaker. In BH, politicians openly defy the law (the constitutional court, verdicts on war criminals etc.). Such scenarios are almost unimaginable in, for example, Germany, Austria or Norway.

In the field of architecture, many buildings were built without required permission and once people notice that it pays to build illegally rather than follow all the procedures, that's what they do. This is applicable in the terms of time required to fulfil all the legal requirements and pay all the necessary taxes, but more importantly for builders, they have "freedom" to do as they like without being questioned by city planners or municipal officials. All the scenarios that emerged from the "transition processes" are well documented in the book Beyond Context (Islambegović, 2022). How long a transition lasts is another question. Certainly, it takes decades to reach the point where justice system functions on the level seen in EU countries, and corruption will exist as long as there are opportunists. In that sense, we can observe that in many cases court buildings are designed to send a message of strength, durability and perseverance. The choice of the finishing material affirms this, and such buildings are usually clad with stone elements and points of possible violations (openings) are severely reduced. Court buildings have to guarantee the legal safety and that is the very reason why so many buildings have these similar aesthetics.

https://commons.wikimedia.org/wiki/File:The_United_States_Supreme_Court_Building.jpg

United States Supreme Court Building, Washington.
Source: Wikimedia Commons, Joe Ravi.



by katarina_dzurekova is licensed under CC BY 2.0. https://openverse.org/image/506f88390-2199-4669-93ea-15f27dd0653f?q=European%20Court%20of%20Justice

European Court, Luxembourg.
Source: Openverse, Katarina Dzurekova.

POST OFFICE

In the Hollywood movies that portray the American wild west, the postal service was often emphasised as one of the essential features. The transition from Pony-Express to telegraph service as a means of sending messages using Morse code, was at the time a major high-tech shift. Post offices in Europe have been erected with a similar sentiment to other important buildings such as the railway stations, hospitals, hotels, or any other government building. This can all be observed in the case of central Post office in Sarajevo, which was placed at a central site near the court house and city theatre and in many ways, it competes with them.

With the introduction of e-mail, many forecast the rapid collapse of the classical postal system. People's habits changed with the introduction of the internet. Previously, most communication was handled through business post, letter and postcards were sent back and forth. Now, it's done much faster and digitally. The same grim future for the post was predicted with the introduction of fax machines however, yet the postal service has hurdled every obstacle so far. The volume of parcel deliveries has increased dramatically over the years since people's shopping needs and habits have changed. Many buy various items over the internet and wait for their parcels to travel around the globe to reach their addresses. In many countries, digital signatures are not yet in place and so people still rely on postal services to send legal documents that need to be signed or delivered in person. Some claim that drone deliveries seem to be future of postal services, yet others believe that human touch is irreplaceable. For sure, we will be able to see further transformation of postal services.

Central Post Office in Sarajevo, BiH. Source: Authors

FIRE STATION

Earthquakes, typhoons/hurricane winds, tidal waves, are all naturally occurring events that usually have disastrous effects on the places where people live. This is mainly to do with the fact that settlements are often built in regions prone to such events and in many parts of the world, buildings are not constructed up to a code. Equally, wild fires can have devastating effects on cities. In the news, we hear how almost every year there are bushfires threatening settlements in Australia or wildfires spreading across the California in United States. However, on a daily basis, there are local fires caused by faulty or stressed electrical installations, faulty home appliances or gas and petrol leaks. Also, there are cases of deliberately placed fires. In any case, it is very important for a city to have in place a fully functional firefighting system which consists of a number of fire stations placed strategically around the city. Why is this important? We can learn from the historic cases such as the Great fire in London in 1666, when more than 13,200 houses and 87 churches were burned (London Fire Brigade, 2024). Such events and learned lessons, helped prompt the revision of building codes to prevent fires from spreading. Fire walls between buildings were erected to prevent fire from spreading from one house to another. Non-burning materials are used in façade systems and hydrant systems were introduced to help the firefighter deal with the fire. All those fire prevention systems come at a cost, which is always smaller than the cost of damaged building.

Fire stations are specific buildings for several reasons, but all have to do with the time saving features. In the interiors, firefighters use slides instead of the staircases and elevators to reach the ground floor where all the fire trucks are parked. Ease of access to city roads is a major requirement and often, fire stations are placed in such a manner that they have several entrances/exits to surrounding streets. Usually, the facades contain the red colour as a direct reference to the nature of the building in terms of 'emergency and urgency'.

Fire station in Sarajevo, BiH. Source: Authors

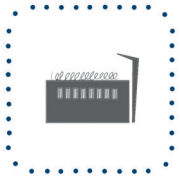
POLICE STATION

A government guarantees the safety of its citizens by establishing and running law enforcement agencies. A portion of taxpayers' money is dedicated to funding police and intelligence agencies. As a typology, police stations do not differ much from other office buildings, yet they have some unique features that all have to do with the security. Holding blocks with cells are usually placed in their basements to minimize potential exit/escape routes and many places within the building have restricted areas. Doors have security locks and in general, buildings are designed to account for emergency situations. Also, the immediate surroundings of the buildings are usually treated with vehicle barriers to prevent potential attacks. Similar to fire stations, their parking lots and garages have multiple entrances/exits to ensure fast access to nearby streets.

State Criminal Police Office, Baden-Wuerttemberg, Germany. Source: Openverse, Thilo Parg.

Police Station in France. Source: Wikimedia Commons, Agence Ameller & Dubois, Luc Boegly.

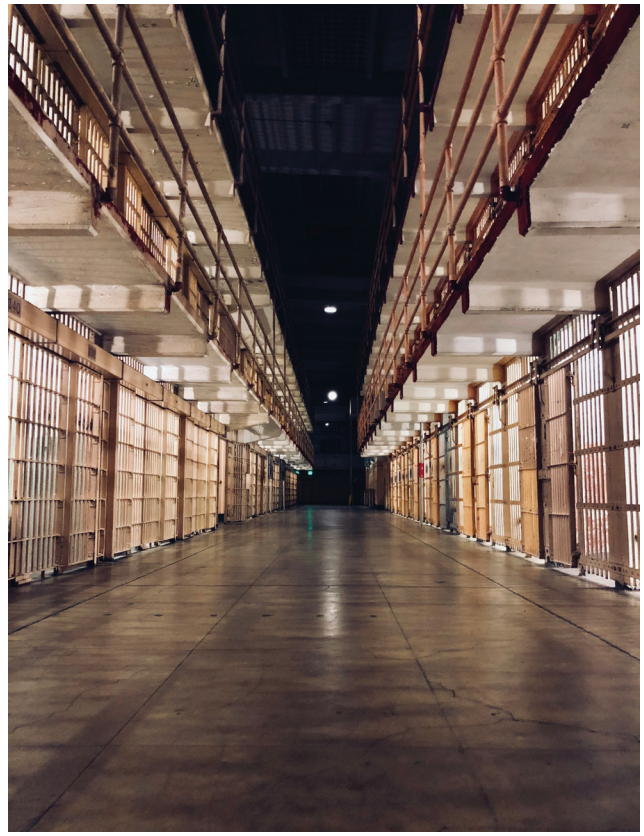
PRISON



There are a few similarities between the student dormitory and prison. Student housing is usually organised in a hotel-like manner with rooms on each side of a corridor. Usually those are two-bed rooms which students share with their roommates. Meals are provided in the cafeteria and there are playgrounds and sports facilities around the dormitory. The "only" difference between the life in the dormitory and prison, is the fact that students are free to go around, attend lectures in other places, and in general don't have restrictions on their whereabouts. For inmates, however, everything is about restrictions, from personal belongings, time spent on various activities, to visits allowed. Although one may see many similarities in terms of building's configuration and programme, major differences are reflected through restrictions. Rooms layouts are simple and treated with materials that are durable and easy to maintain (clean). Furniture is designed with safety features to prevent it from being vandalised. There is almost no privacy in a setting where walls are replaced by prison bars. As opposed to other typologies, where much effort is placed on keeping the burglars/criminals away from the building and preventing them to enter them, with the prisons, the situation is other way around. The never-ending debate is on striking the balance between the humane approach to inmates and providing them with certain quality of life while in prison and not making it too welcoming. Three meals a day, dry and warm room and no additional expenses was for some a calculated decision when making the misdemeanour to come to prison since it seemed a better solution to being homeless or struggling in debt.

In BH's case, the most "famous" prison is located in the city of Zenica and was established in the 19th century. This penitentiary system is based on an Irish model and inmates are granted awards for their behaviour and work.

But the most interesting story about that prison is what happened after the various changes in political systems throughout the history. When Bosnia was annexed by Austro-Hungarian empire, all those sympathizers of the emperor were released, and others filled their cells. Not long afterwards, after WWI, those that objected the new order, were again sent to prisons. In WWII, the partisans that were waiting for their sentences to be carried out, lived to see the liberation day, and all of the sudden, former prison guards became the inmates.



https://unsplash.com/photos/prison-cells-gvwWhABtohs?utm_content=creditShareLink&utm_medium=referral&utm_source=unsplash

Prison Cells, Alcatraz Island, United States.
Source: Unsplash, Carles Rabada.

E GOVERNMENT BUILDINGS

E 1.
CITY HALL

E 2.
COURT HOUSE

E 3.
POST OFFICE

E 4.
FIRE STATION

E 5.
POLICE STATION

E 6.
PRISON

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Sports Buildings

For centuries, the Latin proverb "*Mens (Anima) sana in corpore sano*" offers the best insight on why physical activities are important to people.[3] In essence, it emphasises the relation between physical and mental health. Both components are equally important for wellbeing of people and in the modern era, where physical activity is less part of daily life, it does not come as a surprise that more and more people suffer from mental illnesses. For many, working days are reduced to sitting behind the office desk. Furthermore, even walking from home to work and vice versa, is limited to walking to and from nearby transit station or parking lot.

Although we use the Latin proverb to this day, the roots of organised sports activities were not initiated by Romans, but date back to Greek gymnasiums. Many sports activities were in fact a part of the soldiers' training (wrestling, disk and spear throwing, fencing) and among the Greeks, the Spartans were labelled as the best of them all. However, the ultimate test for all men were the Olympic games. They were organized to entertain the masses and give answers to who was the fastest, who could jump highest and who was the strongest. Those athletes had significant reputations and were perceived as role models and honourable citizens. This has not changed a lot to this day and for many children athletes are still icons and idols. Those who have retired are often perceived as "legends" and "the greatest of them all" ("GOAT").

Since the ancient times, the list of sports has extended significantly. Modern Olympic games were revived at the end of the 19th century as a means of uniting nations under the umbrella of sports. Only recently (2021), their moto "faster, higher, stronger" includes the word "together"[4] because *"we can only become stronger by standing together — in solidarity"* (The Olympic motto, 2021). The Summer and Winter Olympic games are still the greatest sports manifestation in the world and records are constantly being broken.

For professional athletes, designated sports buildings are constructed as their "work places", but those same facilities are used by amateurs for recreation. Perhaps the most valuable reason to have such facilities is for children and youth. From a psychological viewpoint, sports have an important role for the development of children. Through sports they are exposed to a range of emotions from euphoria to sadness and during the process, they learn how to deal with them. Also, acceptance by other team members for a valuable contribution to the team leaves a strong imprint on self-esteem, assurance and confidence.

F.2 FOOTBALL STADIUM

F.3 PUBLIC SWIMMING POOL

3 It is from this that the sports company "ASICS" got its name.
4 The revised motto in Latin is now: "Citius, Altius, Fortius – Communiter"

SPORTS CENTRE

Athens' charter had a profound influence on city planning and living in general. The division of 24-hour day into three equal parts, one part reserved for working, one for free time (sports and leisure) and one for sleeping meant that people had more spare time for entertainment, to pursue hobbies and engage into sports activities. More than 90 years afterwards, many advocate reducing the 40-hour working week so that productivity would increase and at the same time the quality of living would improve, and people could spend more time on the activities they care about (Bregman, 2016). For these reasons, many sports centres are constructed not only to house sports competitions but also to serve the public and fulfil their recreational needs.

Every country has its "preferred" sports discipline. India has adopted cricket as the national sport, Australia, grass hockey just as Canada has the ice version of hockey. In the United States, baseball is a national sport and most of the South America is keen on Football. For Europe it is hard to say which are the favourites: football, basketball, tennis, athletics, volleyball or water polo? This varies from country to country and many competitions are held under the "Euro" banner. So, when it comes to sports centres, we can see that they are organised in such manner to house most of those aforementioned sports. The size of the inner courts is such to allow easy reorganisation when needed, from basketball to tennis, to a five-a-side football pitch. Moreover, due the seating capacity, many of these sport centres can serve as places to host concerts and large events such as exhibitions.

Olympic park in Munich, Germany. Source: Openverse, Ceguenther.

Olympic park in Munich, Germany. Source: Openverse, Maya.

FOOTBALL STADIUM

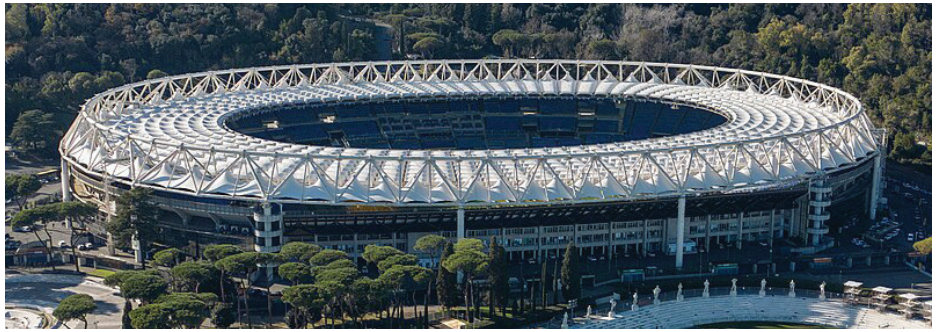
Stadiums are some of the largest sports structures we have. Greeks built them for the purposes of hosting Olympic games and Romans made them iconic. An array of games were organised for the purposes of entertaining the masses in Colosseum or Circus Maximus, which were vast and to this day, still stand remarkably. Stadiums have been predominantly used for athletics but with the appearance of football, the central pitch came into focus. They were designed with 400m circular running tracks as the bases for their width and length, but as football became more and more popular, many stadiums "lost" their running tracks and additional features and became "one function" buildings i.e. football stadiums. Spectators are now brought next to the pitch and those buildings can accommodate tens of thousands of people, still affirming the Latin proverb "panem et circenses" (i.e. bread and circuses).

Whether it is a national league, European or World Cup, football attracts millions of viewers and football stadiums play an important role in making a strong image for the club or country. In many cases, the hosting of the world cup caused large-scale infrastructure projects to be undertaken and resulted in new football stadiums being built that are state-of-the-art in terms of engineering solutions. In such a competitive environment where millions are spent on stadiums that may not be used much afterwards, the recent design for the Doha 974 stadium in Qatar came as a refreshing solution. It was assembled out of 974 shipping containers (Crook, 2021) and disassembled upon the completion of competition, with the possibility of "shipping it" to another location.

Roman Forum and the Colosseum, Italy.
Source: Authors.

Circus Maximus, Rome, Italy.
Source: Authors.

F SPORTS BUILDINGS



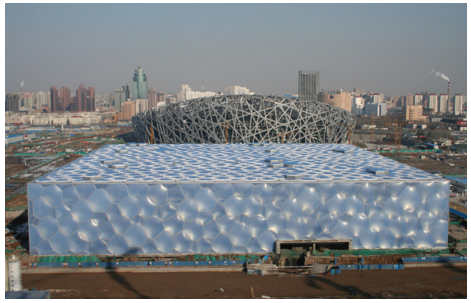
Stadium Olimpico, Rome. Source: Wikimedia Commons, Messapi,

Stadium 974, Doha, Qatar. Source: Flickr, G Travels

Opening ceremony of Doha World Cup. Source: Rawpixel.

PUBLIC SWIMMING POOL

Swimming has a positive effect on human body and for that reason is very useful in rehabilitation processes. Whether it's to prevent muscle dystrophia or promote recovery after orthopaedic surgery, the "weightlessness" that occurs in water, reduces strain on human body while exercising and has therapeutic effects. More often, people use it for recreational purposes and swimming pools are part of the city's public infrastructure. Another reason why it is part of the public infrastructure is to allow for children to learn how to swim. The size of swimming pools varies from the Olympic lengths of 50m (with 10 lanes and a width of 25m) to smaller lengths, 33.3m or 25m. Their size depends on the financial possibilities and sports aspirations, because of the high maintenance costs that they generate. In Europe, coastal countries traditionally have a large interest in the water-based sports and indoor swimming pools are used for clubs and individuals throughout the year. Olympic swimming pools therefore can be used for water polo, synchronised swimming or simply various swimming styles (freestyle, backstroke, breaststroke, and butterfly). For the purposes of diving, platforms with different heights have to be in place and at the same time, the depth of the swimming pool has to be adequate. In terms of construction, these kinds of structures have to have a high resistance to corrosion. Steel is widely used in reinforced concrete to span large distances in swimming pools, so it has to be protected adequately. A high percentage of moisture in the air, combined with the chlorine, has aggressive effect on steel and eventually may cause the structure's collapse, if not treated. Innovative spatial structures have emerged in the past decades (such as Beijing Olympic 2008 swimming pool) yet the cost of maintenance of such a building proved to be too high in many cases (Rio de Janeiro, after the 2016 summer Olympic games) (Farber, 2017).



Olympic swimming pool, Beijing.
Source: Wikimedia Commons, Angus.

Olympic swimming pool, Beijing.
Source: Flickr, Martin Eckert.

F
SPORTS
BUILDINGS

F 1.
SPORTS
CENTRE

F 2.
FOOTBALL
STADIUM

F 3.
PUBLIC
SWIMMING
POOL

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Transit Stations

Horse riding is perhaps the oldest means of land transportation, whereas on the sea, it was rafts and canoes. People used those means of transportation to move from one place to another and cover more distance in a shorter period of time than they would normally do on foot. With the development of commerce, people looked for ways to transport goods from one place to another. On land, horse carriages were used predominantly until the creation of railways and finally, with the introduction of automobile, they vanished altogether. To this day they are used only in rural parts or as tourist attractions or on ceremonial occasions. On water, people built large vessels which were powered by manpower (i.e. rowing) and afterwards sails were introduced. After the invention of steam engine, almost parallel to the development of railway infrastructure, steamboats were used until they were replaced with ships powered by internal combustion engines. Early settlements were founded at suitable locations (with access to natural resources) but those places served as crossroads and ports from where land and naval trade routes were established. In such places, we find transit stations from where you can reach various destinations and change modes of transportation.

Kyoto Train Station, Japab. Source: Openverse, Alessio Jacona.

G.1 AIRPORTS

G.2 BUS STATIONS

G.3 TRAIN STATIONS

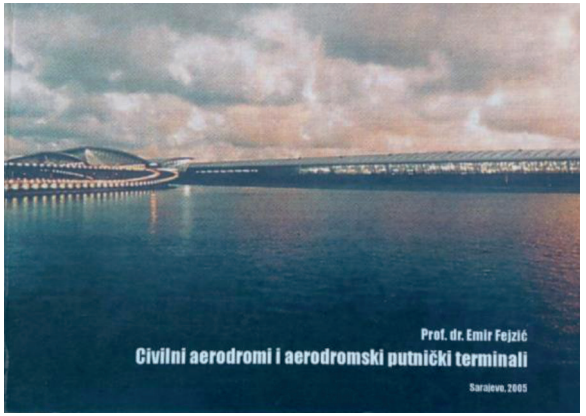
G.4 FERRY STATIONS

G.5 METRO

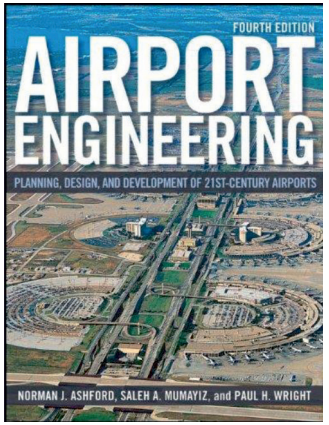
AIRPORTS

Since the very first flight of the 341 kg aircraft (National air and space museum, 2024) built by the Wright brothers in 1903, aviation has advanced tremendously in the following years and already in 1985, we were able to transport more than 640.000 kg through the air in a single aircraft (the An-225) (Antonov Airlines, 2019). Although the military was first to see the benefits of aircraft, it was not long before commercial flights become the most reliable and fastest means of transport of people and goods. Rapid improvements to engines and aerodynamics influenced by the first and second world wars, made it possible to create large planes that could transport several hundred people in one trip. The next challenge was to transport them in the fastest possible manner and with the legendary Concorde, it was possible to travel supersonically on a commercial flight (Fejzić, Civilni aerodromi i aerodromski putnički terminali, 2005, pg. 25). Initial, rudimental buildings placed besides the airstrips, with an increase of passengers, soon became large buildings with dozens of gates. Now there are airport buildings, which due to the various functions they have, can be compared to a small city. Today, airports are differentiated on three levels: a) intercontinental and continental, b) international and domestic airports and c) based on equipment for instrumental flying[5] (Fejzić, Civilni aerodromi i aerodromski putnički terminali, 2005, pg. 40). Airports, as typologies are well elaborated and here are some publications covering that topic (Dearborn, 2004).

5 Non-precision Approach Runway and Precision Approach Runway (Category I, II, III) (Fejzić, Civilni aerodromi i aerodromski putnički terminali, 2005, pg. 40).



Book Cover "Civil Airports and terminals".
Source: University of Sarajevo Library, Emir Fejzić.



Book Cover "Airport Engineering".
Source: Wiley.

BUS STATIONS

In many countries around the world, public transport on an international, national or city scale, is entirely based on the bus network. This is in direct correlation to the established road network and the number of people that gravitate to certain area. Similarly to train stations, bus stations can be described as “main” or “transit” stations - linking major cities to other settlements. Commuters (workers), but more importantly pupils and students rely on this mode of transport to reach their destination on a daily bases. In comparison to train systems, it is very flexible in terms of introducing new lines but on the other hand it has its drawbacks since it is affected by traffic congestion or severe weather conditions, such as snow storms or heavy rain.

Victoria bus station, London. Source: Wikimedia Commons, R Barraez D´Lucca.

TRAIN STATIONS

The invention of the steam engine had a tremendous effect on society by means of revolutionizing the ways people lived and worked. This single invention shifted entire nations towards industrial age and those that were "stuck" using traditional manufacturing systems, soon became irrelevant, losing their status as 'great powers'. This could be argued in the case of the Ottoman empire regarding its decline and eventually its failure to compete with the rest of the European countries. With the introduction of the railway system, large quantities of goods could be transferred alongside naval routes. To this day, railways are one of the main modes of transport. In that sense, we can differentiate between train stations for passenger transport, the transport of goods and combined ones.

Main Train Station, Copenhagen. Source: Authors

Apart from introducing the steam locomotive, another significant engineering solution had to be devised, which meant, quite literally, the reinvention of the wheel. Rail tracks are placed parallel to each other and the wheels are also designed to go alongside those tracks (without the option of turning) so the challenge was to create simple but efficient way of keeping rail carriages on track when they are turning around the bends. Developing a wheel with different circumferences (when seen in cross section) that can compensate the longer travelled distance of the outside wheels from the inside ones (when turning), was an effective solution to the given problem. Development of railway systems also meant that timetables became quite accurate, and the 'minutes hand' on the clocks finally became significant. Prior to this, travelling periods were counted in days or at best in hours. Today we live in the age of levitating trains that move at speeds far greater than possible for family cars and many railway operators take pride in the accuracy of their timetables. The average speed of high-speed trains is 300km/h (Japan, Taiwan, Germany, Spain) up to 320km/h (France) (Fejzić, Suvremeni željeznički putnički terminali, 2011, p. 27). In BH however, there is still a struggle to reach even a fraction of those speeds.

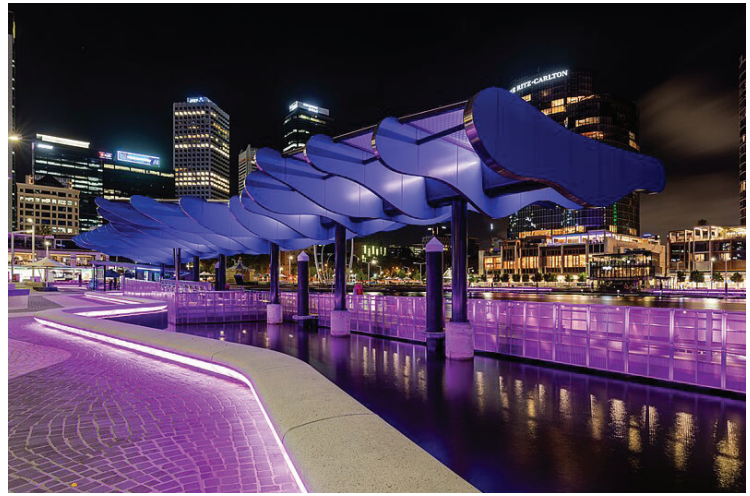
Germany is known for its railway network and to this day, trains are the main mode of transport between cities. The same can be said for the TGV in France, whilst in Japan the "bullet train" is the personification of technological advances of the nation. However, in the less developed countries, bus connections fill this gap, often being the only viable solution to public transport.

Trains stations can be classified based on their character and modes of operations but also location on the grid, importance and construction of the platforms (Fejzić, Funkcioniranje i proračun željezničkih putničkih terminala, 2011, p. 27).

Book Cover "Contemporary railway terminals". Source: University of Sarajevo Library, Emir Fejzić.

FERRY STATIONS

Throughout the world, coastal countries often have elaborate ferry systems in place often to connect their mainlands to their islands. Alternatively, ferry systems were also introduced in countries where large rivers divide parts of the country and where large bridges prove to be too expensive to construct. On habitable islands, there is almost a daily need to bring supplies for shops, so groceries and small trucks are regularly transported by ferry boats. They are used by local people and servicing their needs, but also, ferry boats are used quite often in summertime by tourists to reach their holiday locations. Those connections are maintained usually on an hourly basis but are subject to the weather conditions. The historical importance of ferry system can be seen in the linking of the major economies of UK and France. Before the Channel Tunnel was built, ferries were the only means of transporting lorries, busses and cars between the UK and the rest of the continental Europe. Once the tunnel was opened, the number of ferry rides drastically decreased.



Elizabeth Quay, Ferry Terminal, Perth, Austraila. Source: Wikimedia Commons, Dietmar Rabich.

METRO

Not every capital city in the world has an underground railway system. The size of the city and the number of inhabitants dictate whether a city will have a metro. The famous “mind the gap” warning has become a trademark for the city of London and today, large cities would be paralyzed without the metro system. In terms of public transportation, the metro has all the advantages of the bus and railway modes of transportation. Metro stations have been around now for more than a hundred years and over the years, they have become a landmarks and even artistic galleries (see for example, metros of Paris and Moscow).

Underground station, Vienna. Source: Authors.

Underground station, Rome. Source: Authors.

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- https://commons.wikimedia.org/wiki/File:Victoria_bus_station,_London,_circa_1990.jpg
- https://commons.wikimedia.org/wiki/File:Perth_(AU),_Elizabeth_Quay,_Ferry_Terminal_--_2019_--_0380-2.jpg

Parking Buildings

H PARKING BUILDINGS

ARCHITECTURE FOR CARS

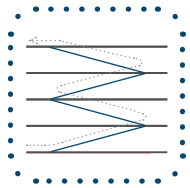
Cars were invented to move. Despite this, they spend most of the time motionless, crowding our streets and public surfaces. As soon as there were cars, the problem of parking began. Cars are the most used form of transport nowadays and are the main object that guided the development of history in the 20th century. The development of indoor car parks is inseparably linked to the growth of the use of cars, for instance, in the US at the time of the Great Depression, 80 per cent of the families owned one. „The spatial problem posed by parking became so acute that following a 1920 streetcar strike, Los Angeles banned daytime curbside parking downtown (Placesobserver).“ After WWI, both the amount of cars and the problems they caused in the cities increased exponentially. Cities tried to respond to this problem looking for ways to store all the resting cars either in old structures (carriages houses), or in new ones specifically designed for automobile storage: the birth of the house for parking.

Thus we can say, there does exist a typology of building which tries to give a solution to parking problems in cities, despite of the fact that indoor car parks as a distinct building type hardly appear in the histories of modern architecture. The existence of a parking typology is important to build a sustainable environment and have emerged as a result of the search for a better choice of land use, rather than simply allowing the spread of cars across the city floor. Thus, we can agree that the design of parking buildings is an important issue nowadays.

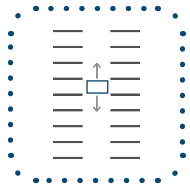
Car parks are public facilities, an infrastructure where the exchange of transportation takes place. The main features that have to be integrated in the design are FUNCTIONALITY, OPERATIONALITY, SAFETY and EFFICIENCY. Vertical construction became typical of indoor car parks in large cities, due to the huge amount of city-floor area one single storey garage at street level would need. Car parks are systematic buildings, which are designed around mainly one issue: circulation. The biggest challenge for this building typology is how to connect the different storeys and allow cars to circulate easily. There are 2 main solutions: a ramp, and a lift, or a combination of both. In this way, we can categorize the parking house typology in 2 groups within the two solution for the conection challenge:

RAMP SYSTEM
AUTOMATED MECHANICAL FACILITIES (lift)

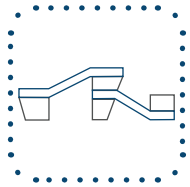
As Le Corbusier said, *“The motor-car marks the style of our epoch.”*



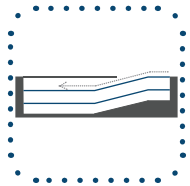
H.1 MULTI-STOREY CAR PARKING



H.2 SILO STORAGE



H.3 HYBRID PARKING



H.4 UNDERGROUND GARAGE

H PARKING BUILDINGS

H 1. MULTI-STOREY CAR PARK / PARKING DECK

H 2. STORAGE SILO

H 3. HYBRID PARKING

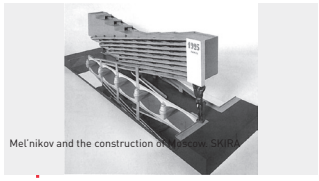
H 4. UNDERGROUND GARAGE

FIRST AUTOMOBILE

powered by its own four-stroke cycle gasoline engine

Inventor: Karl Benz
Location: Mannheim (Germany)

1885



1925

INDOOR CAR PARK PARIS (1925)

Architect: Konstantin Melnikov
Location: Paris
System: straight ramp
Achievement: Eastblishing a prototype of a parking house. Although technically impossible to construct, he planned the main ideas for a parking building as a prototype, as a model, of which, development started up to the 1940s:

big surfaces
sloped levels
naked structures

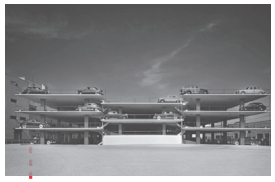
1931-1934

AUTORIMESSA COMUNALE S. ANDREA (1931-1934)

Architect: Eugenio Miozzi
Location: Venice
System: helicoidal ramp
Function: node that gives access to Venice
Achievement: it was the first large-scale parking building.

WW2

1948



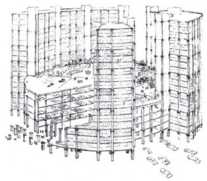
MIAMI PARKING GARAGE (1948)

Architect: Robert Law Weed and Associates
Location: Miami
System: ramp
Achievement: the walls and the facades of the car parking building were removed. He wanted to show the functionality of the building. Meanwhile he improved the illumination and ventilation of the inside.

1957

TCIVIC CENTER PROJECT (1957)

Architect: Louis Kahn
Location: Philadelphia
System: helicoidal ramp
Achievement: starting point of interchange buildings. It was a big cilindrical parking tower, the centre of which was dedicated to pedestrians.

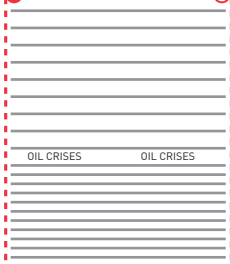


1963

TEMPLE STREET GARAGE (1963)

Architect: Paul Rudolph
Location: New Haven (Connecticut)
System: straight ramp
Achievement: one of the first designs of architecture for cars that sought to dignify them. A brutalist building that dealt with cars and movement.

1973

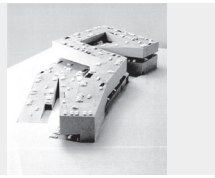


1973:
OIL CRISES + ECOLOGICAL DISASTER = GAP IN THE EVOLUTION

The evolution of car-parking typologies almost stopped until the 90s. Cars started to be stored in underground parking.

1990

1994



PARKHOUSE/CARSTADT (1994)

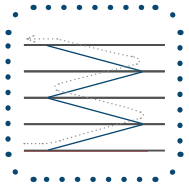
Architect: NL Architects
Location: Amsterdam
System: ramp
Achievement: creation of a mixed use architectural program, a catalyst for urban life by fusing architecture with infrastructure.

2005-2010

11 11 LINCOLN ROAD (2005-2010)

Architect: Herzog & de Meuron
Location: Miami, Florida, USA
System: straight ramp
Achievement: a variation of the standard parking deck structure. The car parking house is shown as a real designed piece of architecture.

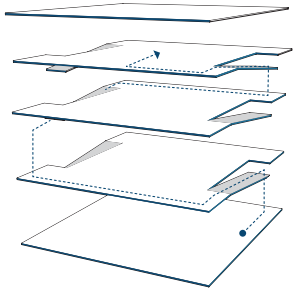
MULTI-STOREY CAR PARKING

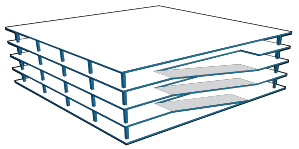


H.1 MULTI-STOREY CAR PARKING

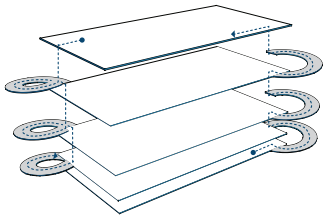
TYPOLOGY: Multi-Storey
Connection system: ramps (straight and helicoidal)
The soutions are completely standarized in patents

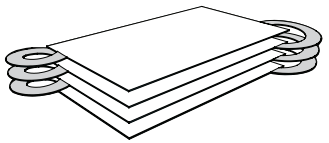
straight ramps



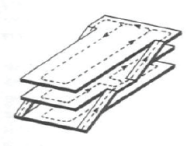


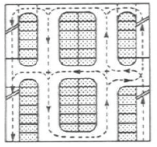
helicoidal ramps

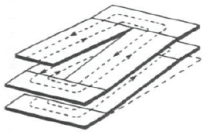


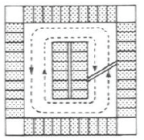


FEATURES

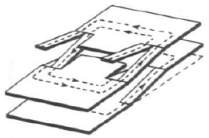


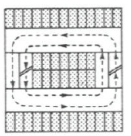




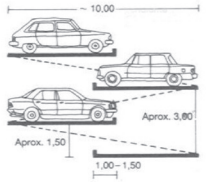


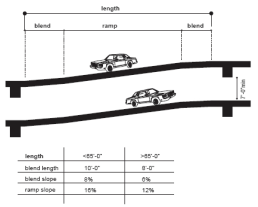
Inclined storeys
Aditional ramps are not necessary
Less space is used
Slope<6%



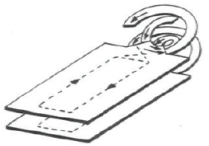


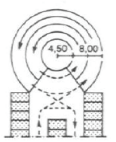
D´Humy ramps
Parking of intermediate storeys
Shorter ramps



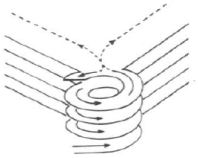


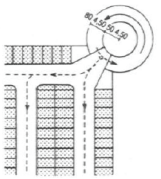
Materials, structures and standards.





Double helicoidal ramps, with diferent up and down lanes, located one above the other.
Crossfall <3%
Inner radius >5m
The smaller the radius, the wider the ramps.





Independent up and down helicoidal ramps.
Turning ratio

Neufert , Gustavo Gili, 1995

MULTI-STOREY CAR PARKING

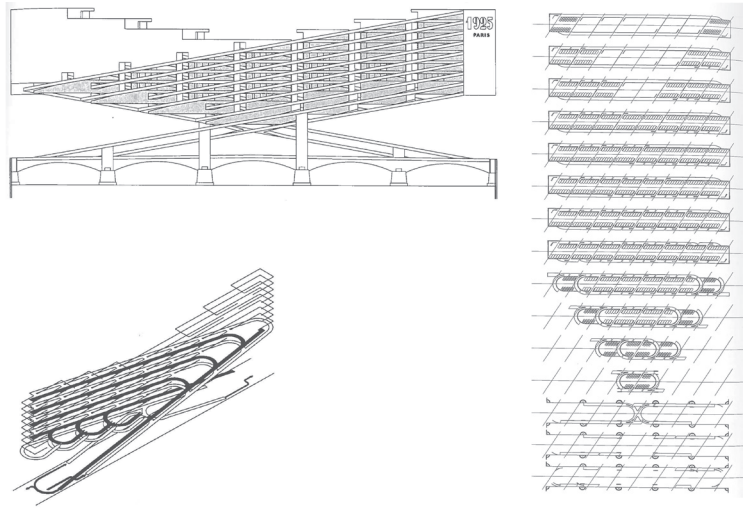
INDOOR CAR PARK PARIS (1925)

Architect:	Konstantin Melnikov
Location:	Paris
Use:	parking
Realization:	unbuilt but influential
Number of parking spaces:	1000
Floor height:	~2 m
Storeys:	8
Basements:	0
Floor area:	
Connection system:	ramps
Density:	

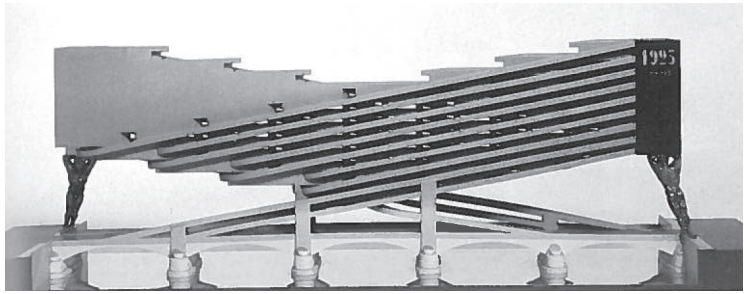
Melnikov was the first architect who changed the conception of a garage building. He added expressiveness to his car park designs.

The success of the Soviet pavilion at the "Exposition des Art Décoratifs" brought Melnikov an unexpected commission from the city of Paris: to produce a design for an indoor car park for taxis with a capacity of a thousand vehicles. His proposal involved a few general principles as for example that ascending and descending paths should not cross, that the gradients of all ramps should be the same, that the bend should have the same radius and that there should be the least possible number of bends. He defended the idea of the utilisation of the whole available floor area for parking in the way that traffic lanes consisted entirely of ramps.

The traffic flow system was based on the principle of a twofold double spiral ramp (two separate ascending and decending routes. He used the diagonal as the organising principle for his design. The system of ascending and deceding seemed very advanced for his time, but also, not completely clear.



Car parking, Konstantin Melnikov. Source: Hiddenarchitecture.



Car parking, Konstantin Melnikov. Source: Hiddenarchitecture.

MULTI-STOREY CAR PARKING

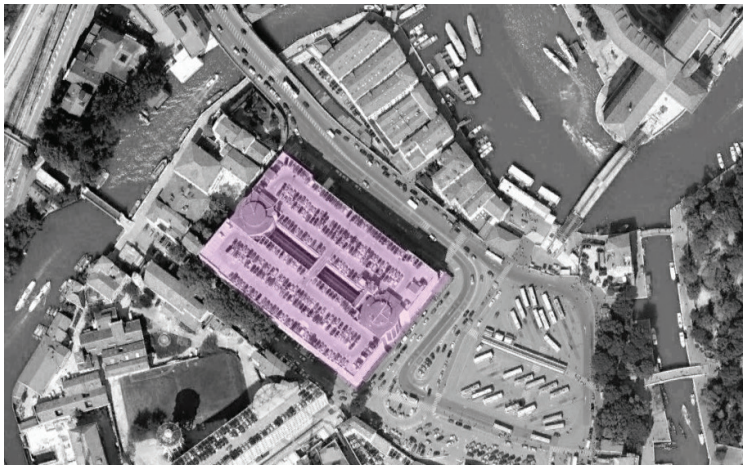
AUTORIMESSA COMUNALE S. ANDREA (1931-34)

Architect:	Eugenie Miozzi
Location:	Venice
Use:	parking
Structure:	concrete multi-decks
Realization:	built
Number of parking spaces:	
Floor height:	3 m
Storeys:	6
Basements:	-
Floor area:	9240 m2
Connection system:	2 helocoidal ramps
Density:	

This was the first large-scale parking building.

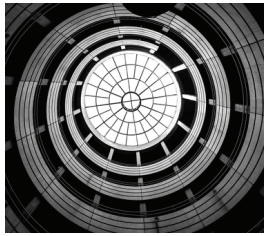
Its function was to house the cars of visitors to Venice, since the city is not a place suited for cars. The garage is located in the node that gives access to Venice.

The different floors can be reached by two helicoidal ramps, located in the opposite sites of the buildings. One is the ascending node and the other, the decending.



Car parking, Venice. Source: Google Maps

Car parking, Venice.
Source: Artefascista, Gianni Porcellini.



Car parking, Venice.
Source: Flickr, Fab. A.

MULTI-STOREY CAR PARKING

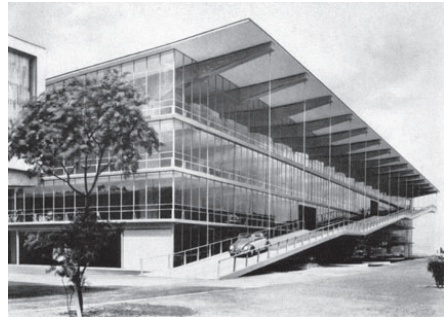
HANIEL-GROßGARAGE (1950)

Architect:	Paul Schneider von Esleben
Location:	Düsseldorf (Grafenberger Allee)
Use:	parking house
Structure:	concrete butterfly columns with glass skin
Realization:	built
Number of parking spaces:	500
Floor height:	3 m
Storeys:	4
Basements:	0
Floor area:	3500 m^2
Connection system:	ramp
Density:	28 m^2/car

Germany boasts some of the most remarkable examples of parking structures. Among them is the Haniel Parkhouse, which holds the distinction of being West Germany's first multistorey car park post-war. Its design features external access ramps suspended from cantilevered concrete girders that support the roof. The building's full glass facade imparts a sense of unprecedented lightness and transparency, making it both functional and aesthetically pleasing.

Listed as a historic building in 1985, the Haniel Parkhouse underwent restoration in 1992/1993. Although it no longer serves as a public multi-storey car park, it now houses a BMW dealership.

Car parking, Düsseldorf, Germany. Source: Google Maps



Car parking, Düsseldorf, Germany. Source: Architekturdatenbank, Andrea Gonzales.

Car parking, Düsseldorf, Germany. Source: Baukunst.

MULTI-STOREY CAR PARKING

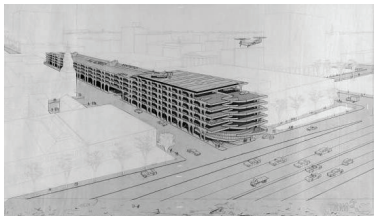
TEMPLE STREET PARKING GARAGE (1962)

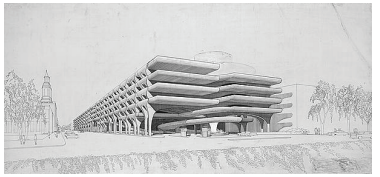
Architects:	Paul Rudolph
Location:	New Haven (Connecticut)
Use:	parking house
Structure:	concrete
Realization:	built
Number of parking spaces:	
Floor height:	
Storeys:	
Basements:	
Floor area:	
Connection system:	ramp
Density:	-

In 1962, Paul Rudolph designed the Temple Street Garage in New Haven. He sought to create a place of dignity for the car, through a dynamic horizontal composition of concrete. Pauk Rudolph continued adding to his brutalism lexicon with the design of this building.

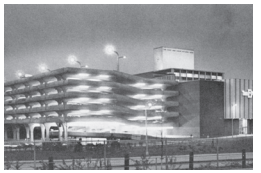
He mentioned that „most parking garages were merely skeletal structures which didn't have any walls, just office building structures with the glass left out." (EPFL). Instead of this, he wanted to make a building which said it dealt with cars and movement. He wanted there to be no doubt that this is a parking garage.

The 700-foot-long Brutalist structure holds 1,300 cars. From its top floor, under concrete cobra lights, you can see the steeples of the New Haven Green.





Car parking, New Haven (Connecticut), USA. Source: Source: Hiddenarchitecture.



Car parking, New Haven (Connecticut), USA. Source: Hiddenarchitecture.

MULTI-STOREY CAR PARKING

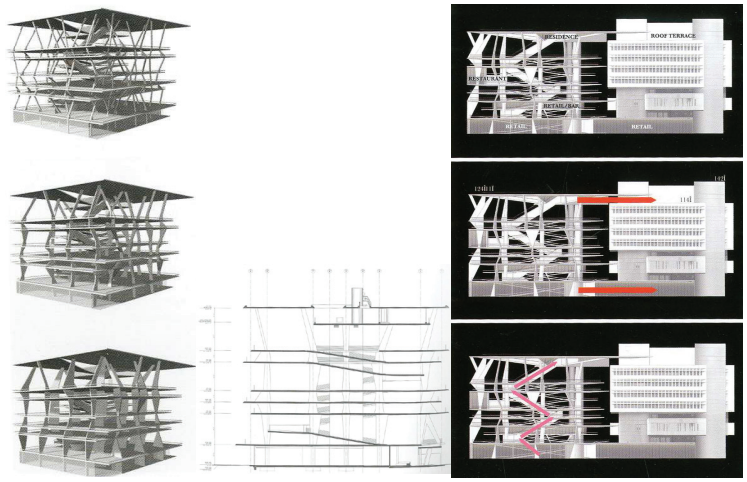
1111 LINCOLN ROAD (2005-2010)

Architects:	Herzog & deMeuron
Location:	Miami, Florida, USA
Use:	mixed; housing, shop, parking and public space
Structure:	fully open concrete structure
Realization:	built
Number of parking spaces:	300
Floor height:	changeable (standard, double or triple height 3-6-9 m)
Storeys:	8
Basements:	0
Floor area:	4900 m2
Connection system:	ramp
Density:	-

The mixed-use project at 111 Lincoln Road comprises four distinct parcels. One of these parcels features a multi-use space that includes parking, shops, and housing.

The structure, designed with concrete and glass, consists of concrete slabs that serve as floor plates, columns, and ramps. Architect Jacques Herzog described it as quintessential Miami Beach—"all muscle without cloth."

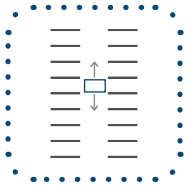
Each level of this cultural parking facility is bathed in natural light, offering striking views of the city. At its base, the retail spaces provide seamless access to a newly transformed public space



Car parking, Miami, USA.
Source: Source: Herzog & de Meuron 2005-2010 EL CROQUIS.

Car parking, Miami, USA. Source: Flickr, Maciek Lulko.

STORAGE SILO



H.2 STORAGE SILO

TYPOLOGY: Silo sorage
Connection system: ramp and lift

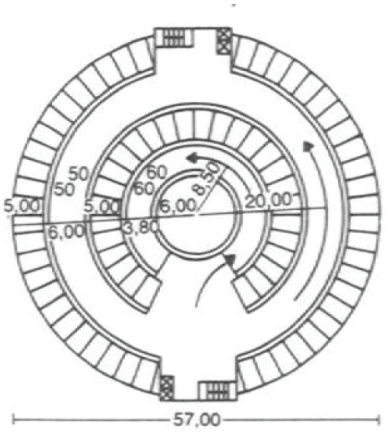
ramp system
(helicoidal ramp)

automated system
(lift)
more expensive

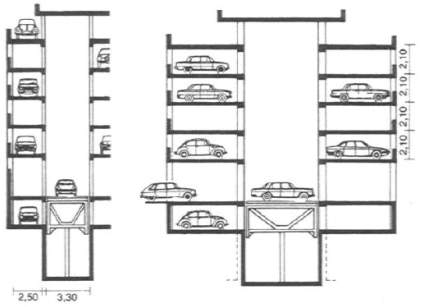
saves space

more cars per side

FEATURES



Ramp system:
helicoidal ramp system with incorporated parking lots.



Neufert , Gustavo Gili, 1995

Automated system: „An elevator carrier moves vertically in the inner shaft up and down to convey a pallet with a vehicle from the entry/exit opening to parking floors. A rotary base mounted on the elevator carrier rotates 360° around the central axis.“ (Freepatentsonline).

The silo structure of a vehicle parking system includes multi-layers of parking floors. Each floor is divided into several sector-shaped parking spaces with equal separation and angle intervals around the central axis of the silo structure.

STORAGE SILO

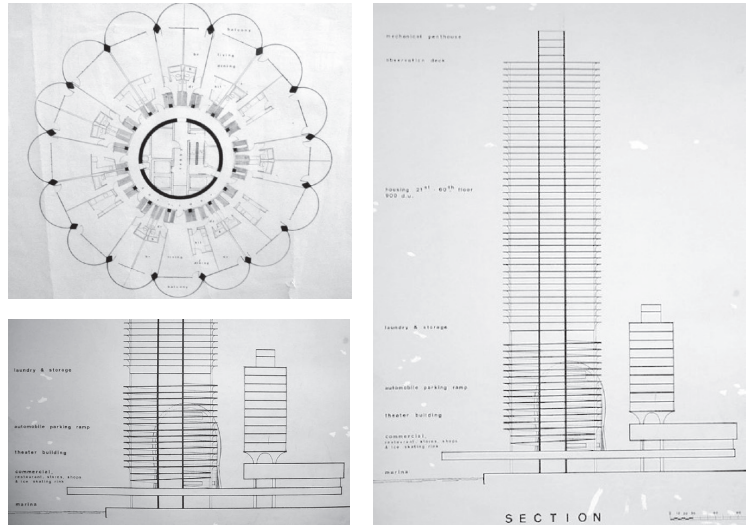
MARINA CITY CHICAGO (1959-1964)

Architect:	Bertrand Goldberg
Location:	Chicago
Use:	mixed-residential, commercial, offices and parking
Structure:	
Realization:	built
Number of parking spaces:	896
Floor height:	3
Storeys:	65 (first 16 storeys are parking)
Basements:	-
Floor area:	
Connection system:	helocoidal ramp
Density:	

The Marina City complex, designed by architect Bertrand Goldberg in 1959 and completed in 1964, was a pioneering project. Upon completion, the twin towers were the tallest reinforced concrete structures in the world (Wikimili).

Goldberg's vision for Marina City was to create a "city within a city," seamlessly integrating residential, commercial, and automobile functions. This mixed-use model, featuring high-rise towers with a parking base, has since become a global standard for urban development.

The design was heavily influenced by the automobile, particularly in terms of scale and circulation. The parking structure at Marina City is distinctive, with no other facility being as tall, slender, or fully embodying the spiral form. The lower third of each 65-story tower is dedicated to a continuous up-spiral parking garage, accommodating 896 vehicles per tower. (Roboticparking)



Storage Silo, Chicago, USA. Source: Architechgallery.

Disclaimer: The sketches/images/drawing/pictures used at this particular page are for educational purposes only and they are property of the represented office/authors.

Storage Silo, Chicago, USA. Source: Wikipedia, Diego Delso.

Storage Silo, Chicago, USA. Source: Wikimedia Commons, Ken Lund.

STORAGE SILO

VW PARKING GARAGE SILO (2000)

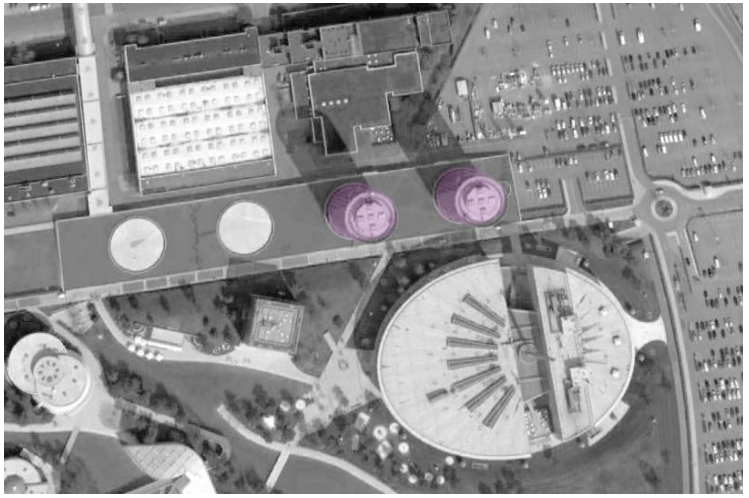
Location:	Wolfsburg, Germany
Architect:	Gunter Henn
Use:	factory parking
Structure:	glass-encased steel construction
Realization:	built
Number of parking spaces:	440
Floor height:	3 m
Storeys:	20
Basements:	underground tunnel
Floor area:	314 m^2
Connection system:	lift
Density:	14,27 m^2

This car silo is located in the town that developed around Volkswagen. It is part of a car-themed park that attracts over 2 million visitors annually. The park celebrates the automotive industry and facilitates car sales.

The silo stores cars awaiting purchase and operates like a giant vending machine. You select the car you want, and it is retrieved from one of the 20 stories by a standardized system that uses elevators to move the cars along a supporting structure.

Cars are transported to the towers at a speed of 1.5 meters per second. Two fully automated, high-rise stacks use robotic arms to retrieve the cars and deliver them to their new owners (Idesignarch).

Each of the two towers is a 60-meter-tall glass silo, connected to the Volkswagen factory by a 700-meter underground tunnel (Idesignarch).

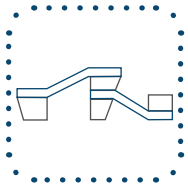


Storage Silo, Wolfsburg, Germany. Source: Google Maps

Storage Silo, Wolfsburg, Germany. Source: Flickr, Saskane.

Storage Silo, Wolfsburg, Germany. Source: Flickr, Saskane.

HYBRID PARKING



H.3 HYBRID PARKING

TYPOLOGY: Hybrid parking
CONNECTION SYSTEM: depends on the whole building's design

HYBRIDS: A Convergence of Architecture and Infrastructure

The concept of hybrids emerged at the end of the 19th century, as densely populated cities began to embrace the inevitable overlap of functions. Centrality played a crucial role as the catalyst for this change (Aplust).

Hybridity arose from the disproportionate increase in land prices and the rigidity of urban layouts. Unlike traditional parking schemes, where parking is spatially separated from the building's main functions, hybrid spaces integrate parking and building programs. This synchronization enhances the experience of driving and parking, making them integral to the building's design.

Hybrids are:

A celebration of complexity, diversity, and a variety of programs.

Unique creations without previous models.

Opportunity buildings that leverage their multiple functions.

Spaces where private and public spheres meet.

Mixes of uses that generate potential.

Hybrid buildings defy classification by typology, as their very essence is to transcend traditional categories.

HYBRID PARKING

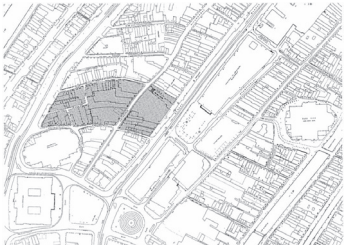
PARKHOUSE/CARSTADT (1994-1995)

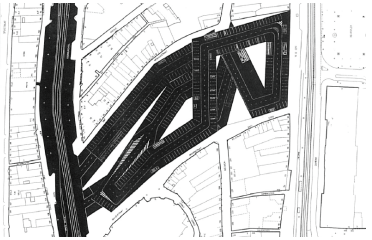
Architects:	NL Architects
Location:	Amsterdam
Use:	Mixed; parkhouse+shops+offices+ apartments+hotel.
Structure:	located on the roof
Realization:	unbuilt - Final Project, Technical University Delft
Number of parking spaces:	~300
Floor height:	open/roof
Storeys:	8
Basements:	0
Floor area:	19.000 m^2
Connection system:	ramp
Density:	63 m^2/car

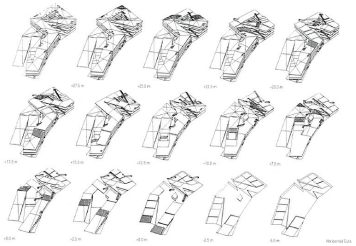
The automobile served as the catalyst for this project. By fusing architecture with infrastructure, the architects combined car parking and mixed-used architecture: establishing the principles of a car-chitecture of the future.

The car park is located on the top of the building, the roof became a road and a parking surface. The tilted surface provide the users with a different experience across its changeable surfaces, an artificial topography which would afford spectacular views across the historic city of Amsterdam.

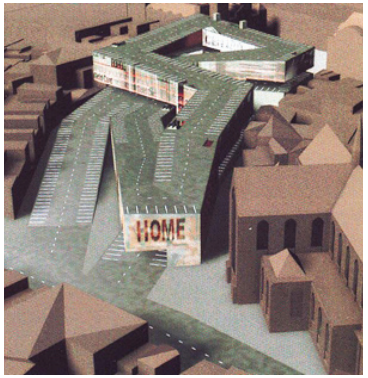
The parkhouse/Carstadt is a folded 1 km long road, with a 19 meter wide parking ramp of 3,5-5 % with a max of 6%. Two traffic routes allow the building to vary in length: a minimum of 2,5 m and a maximum of 2000m.

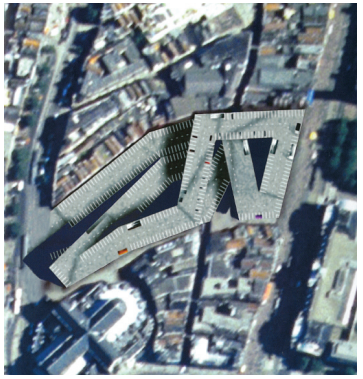






Hybrid parking, Amsterdam, Netherlands. Source: NLarchitects.





Hybrid parking, Amsterdam, Netherlands. Source: NLarchitects.

HYBRID PARKING

IJBURG 23 (1999-2004)

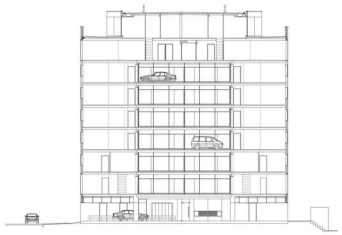
Architects:	VMX architects
Location:	IJburg, Amsterdam
Use:	Mixed; housing + garden + parking
Structure:	integrated within housing
Realization:	built
Number of parking spaces:	28
Floor height:	3 m
Storeys:	7
Basements:	1
Floor area:	
Connection system:	car lift
Density:	-

"VMX Architects could not ignore the idea that people preferred a house with a garden and a parking space" (VMXARCHITECTS). Their concept responded to the demand of suburban dream: drive in houses.

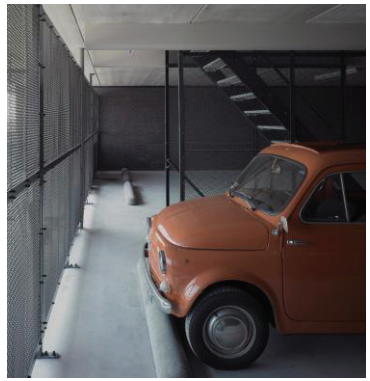
Parking places for both, houses and apartments are located within the first six levels of the tower.

"The spaces above ground level can be accessed by a car-lift. The advantage of this arrangement over a conventional underground parking garage is that is that the houses can have real gardens with trees planted in the ground and yet apartment owners have the possibility of having their car beside their front door" (VMXARCHITECTS). It enhances the good relationship between owners and cars.

Block 23 was divided into 3 hybrids that consists of 25 houses and 28 apartments, with eight housing types.



Hybrid parking, IJburg, Amsterdam. Source: Google Maps.



Hybrid parking, IJburg, Amsterdam. Source: Archiweb.

HYBRID PARKING

ASPHALT SPOT (2003)

Architects:	R&Sie
Location:	Tokamashi, Japan
Use:	Mixed; parkhouse + landscape + exhibition room
Realization:	built
Number of parking spaces:	20
Floor height:	open/roof
Storeys:	8
Basements:	1
Floor area:	300 m^2
Connection system:	ramp
Density:	15 m^2/car

The project was commissioned by the Art Front Gallery. The architects created this building as a mixture between landscape and infrastructure with the result of an art installation.

Creation of an outdoor exhibition space in the shape of a deformed square within a car park, created a structure that seems to have been shaken by an earthquake, or melted by an overheating reaction.

"Scenario:

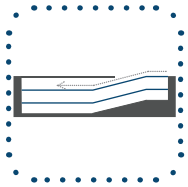
1) Asphalt Drop on the site
2) Twisting the black surface of the car park to integrate indoor/ outdoor rooms (cellar and facilities)
3) Visitors are tempted to drive or walk up the slope as a way to handle their own disequilibrium." (Blogspot).

Hybrid parking, Tokamachi, Niigata, Japan. Source: Google Maps.

Hybrid parking, Tokamachi, Niigata, Japan. Source: Wikipedia, Qurren.

Hybrid parking, Tokamachi, Niigata, Japan. Source: Flickr, Akinali Nishimula.

UNDERGROUND GARAGE

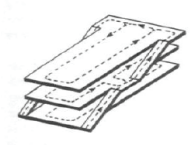


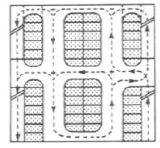
H.4 UNDERGROUND GARAGE

TYPOLOGY: undergound garage
CONNECTION SYSTEM: ramps (straight and helicoidal)

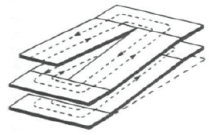
The soutions are completely standarized in patents

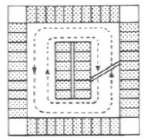
FEATURES (The same rules for multi-deck parking buildings are used)



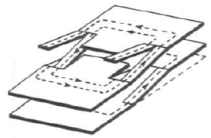


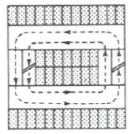
Straight ramps between different storeys
Independent up-lanes and down-lanes
Slope<15-20%



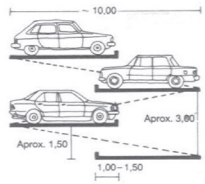


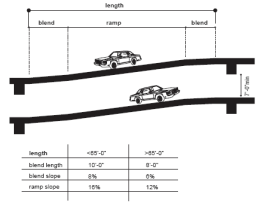
Inclined storeys
Aditional ramps are not necessary
Less space is used
Slope<6%



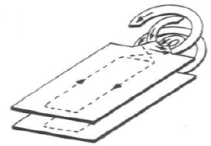


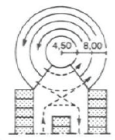
D´Humy ramps
Parking of intermediate storeys
Shorter ramps



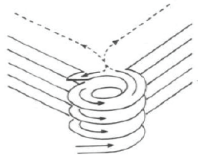


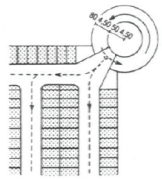
Materials, structures and standards.





Double helicoidal ramps, with different up and down lanes, located one above the other.
crossfall <3%
Inner radius >5m
The smaller the radius, the wider the ramps.





Independent up and down helicoidal ramps.
Turning ratio

Neufert , Gustavo Gili, 1995

UNDERGROUND GARAGE

CHASSÉ TERRAIN. BREDA (2000)

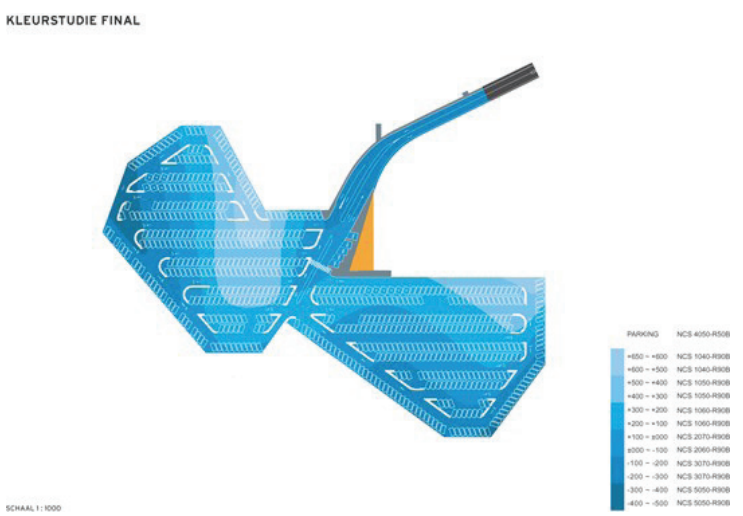
Architect:	OMA
Location:	Breda
Use:	parking
Structure:	concrete wall pillars and deck with light patios
Number of parking spaces:	670
Floor height:	open/roof
Storeys:	-
Basements:	1
Floor area:	18.500 m2
Connection system:	ramp
Density:	27,6 m2/car

This structure marks a point of turnover in the design of parking structures, changing the common image of parking buildings we had before. This light-filled space (13 large patios) was created to make the users feel welcome and safe.

The brief was to enhance the qualities of ordinary parking building designs.

“This building marks the end of parking structures as we have known them. It seeks to provide a service for its clients from door to door. The main design criteria was to provide an overall sense of being led into a light, open space in which one feels welcome and most importantly, safe. There are no dark corners, walls or slabs that can hide assailants. Daylight pours in through 13 very large patios. Every element in the design has been weighed over and over against the client’s brief, surpassing any existing quality benchmark in parking edifice design.” (OMA).

Parking is laid out on a 70 degree angle for easy access and entry of parking bays. The route is strictly one way, so it is impossible to get lost.



Underground Garage, Chassé Park, Breda, Netherlands. Source: Archiweb.

UNDERGROUND GARAGE

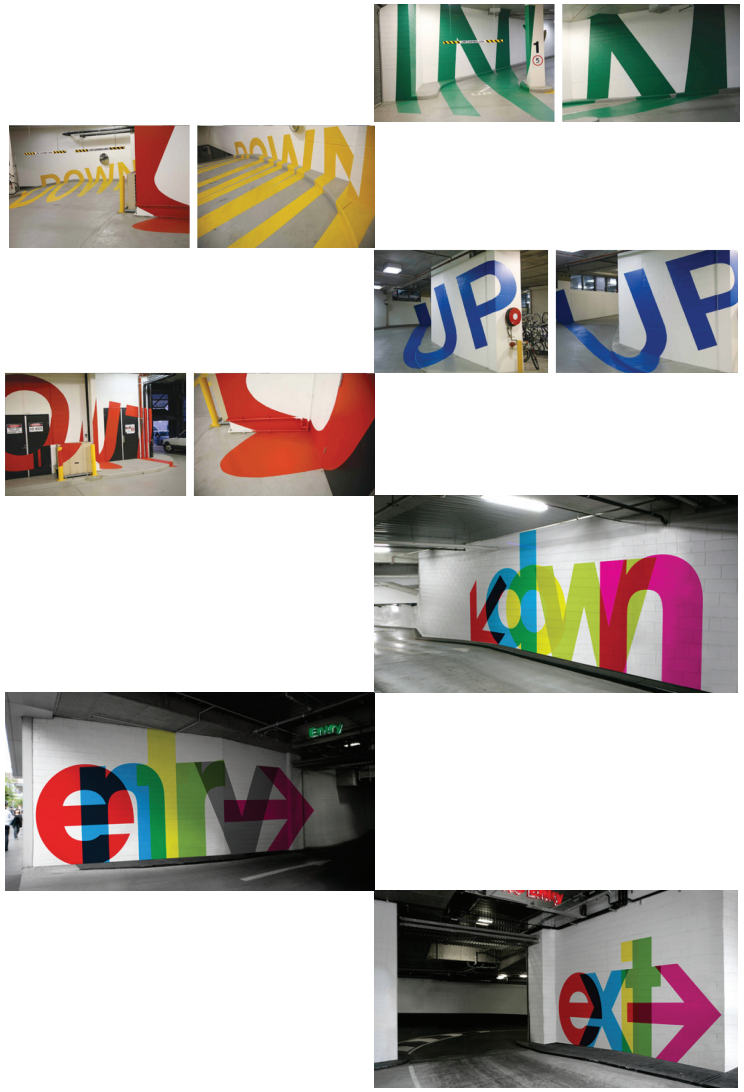
EUREKA CARPARK

Designer:	Emery Studio (Axel Peemoeller)
Location:	Melbourne
Use:	parking
Structure:	underground concrete garage
Number of parking spaces:	
Floor height:	3
Storeys:	-
Basements:	
Floor area:	
Connection system:	ramp
Density:	-

This showcases the innovative way-finding system at the Eureka Tower Carpark. The Eureka Tower, a 90-story residential building, features a single carpark garage for its residents.

Designer Axel Peemoeller created a unique system to guide visitors through the garage. As you navigate the interior, long lines of color converge to form words, such as “OUT” in red near the exit and “UP” in blue as you approach a ramp. These distorted letters on the walls become clear from the correct vantage point, creating monumental messages that enhance the experience of arrival and departure with bold graphic illusions. This system uses both ambiguous and literal information through false perspectives to provide guidance at crucial decision points.

The vibrant mix of paint colors serves a functional purpose, changing based on your position within the Eureka Carpark in Melbourne. (Kosmograd)



Underground Garage, Melbourne, Australia. Source: violetsareflowers.

H
PARKING
BUILDINGS

H 1.
MULTI-STOREY
CAR PARK /
PARKING DECK

H 2.
STORAGE SILO

H 3.
HYBRID
PARKING

H 4.
UNDERGROUND
GARAGE

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- https://ja.wikipedia.org/wiki/%E3%83%95%E3%82%A1%E3%82%A4%E3%83%AB:Echigo-Tsumari_Art_Field_T-067_Asphalt_Spot.jpg
- https://www.flickr.com/photos/89097640@N00/7969289498
- https://www.archiweb.cz/en/b/podzemni-parkoviste-chasse
- https://violetsareflowers.wordpress.com/2011/03/30/latitude-group-qv-melbourne-wayfinding-graphics/

Ports

ARCHITECTURE FOR THE WATERBORNE TRANSPORTATION OF GOODS AND PEOPLE

"...the best way to move something heavy from here to there was and is to float it there. This truth is as true now as it was in the days of Homer´.

John Szarkowski, A Maritime Album: 100 Photographs and Their Stories, 1997

The waterways of the world have always dictated where and when cities would be established and grow, focusing on their ports, as gateways for trade and arenas for exchange

Liquid and solids interpenetrate. The function of a port is to communicate with both land and sea - boats/ships and landside transportation. Harbors respresent an exchange of transportation for both people and goods.

The layout and architecture of a port is a combination of a number of key characteristics: its location, type(s) of harbor sheltering, type(s) of goods handled and how the port relates to national and international tansportation interests. It is therefore interesting to study each feature independently, understand what it is and which effects it has, and then study how it works together with other features exemplified in the different ports that we find today.

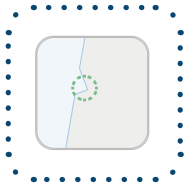
In earlier times, the type of shelter was more or less the key element of any harbor, as it was the naturally assigned capacities of each location that determined its image and architecture.

This only slowly changed during the 19th/20th century. Today, however, as man increasingly overcomes nature and becomes able to create a landscape of his own, size is more important and it is the number of goods handled that determines the port architecture and infrastructure.

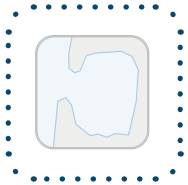
PORT:
A port is a location on a coast or waterfront containing one or more harbors where ships can dock and transfer people or cargo to or from land.

HOME PORT:
The port from which a ship loads or unloads its goods and/or passengers.

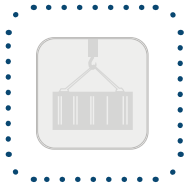
PORT OF CALL:
An intermediate stop for refueling.



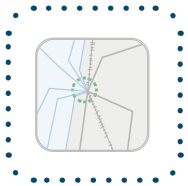
I.1 LOCATION



I.2 TYPE OF SHELTER

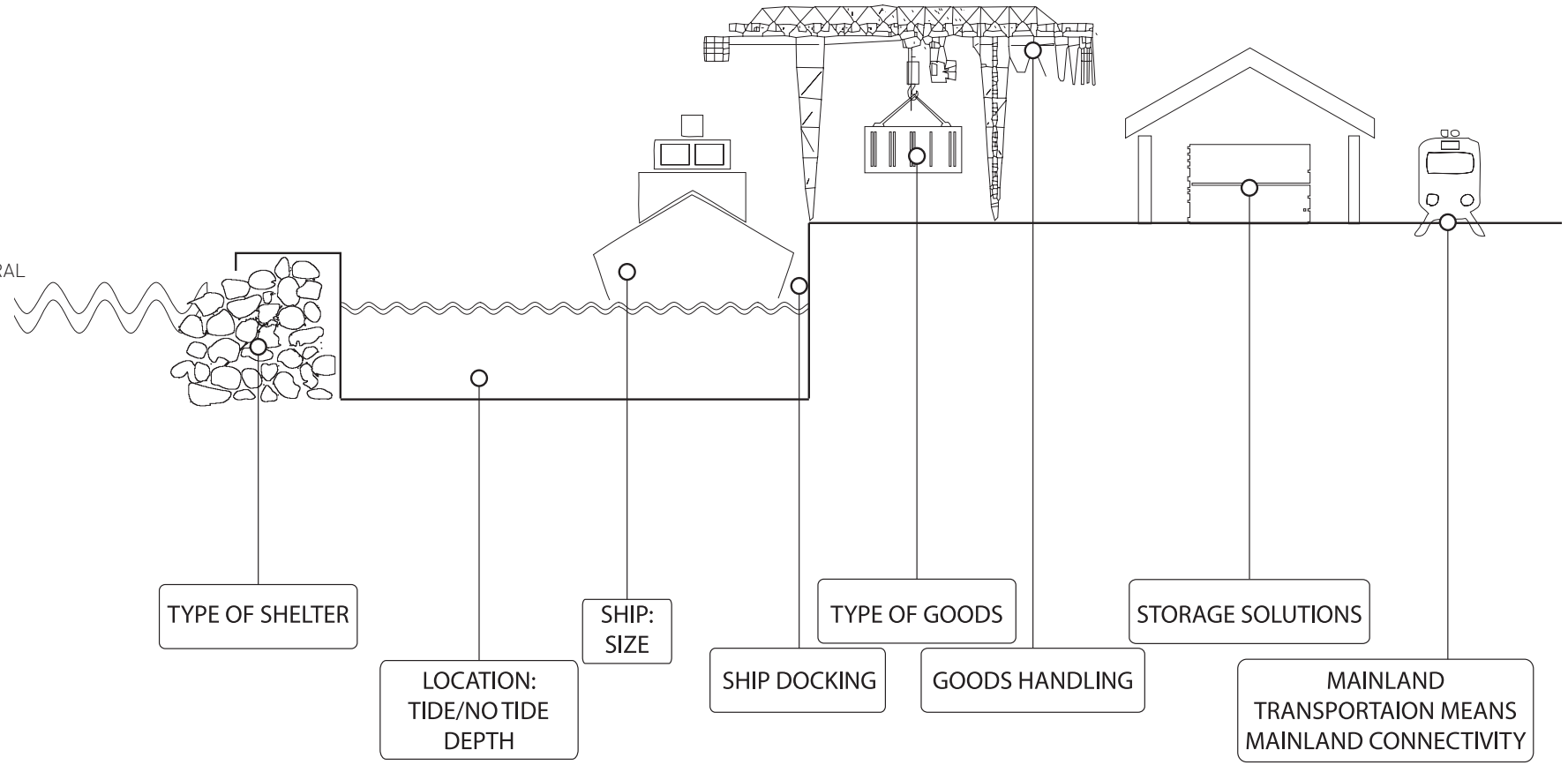


I.3 TYPE OF GOODS



I.4 PRIORITY

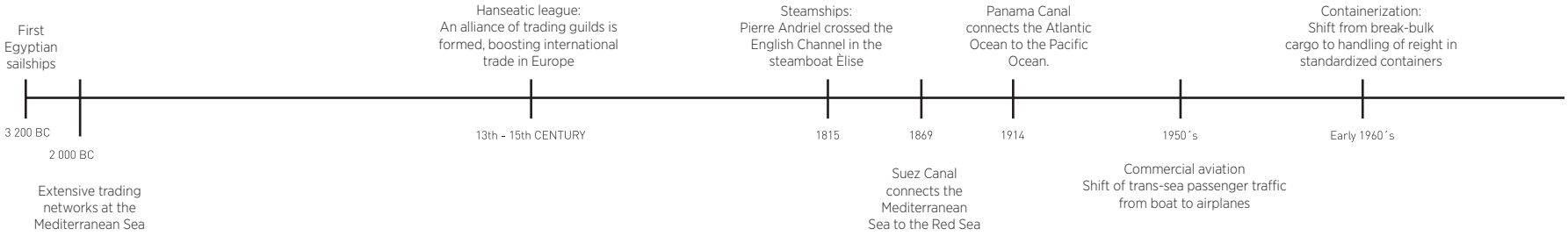
A PORT'S MAIN ELEMENTS



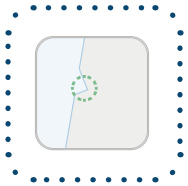
I PORTS

The history of the world's ports is closely linked to the history of maritime transportation, meaning the type of ships, shipping routes and type of freight carried.
Certain events in world history such as the invention of the steam engine, the airplane, and of containers, have had huge impact on what kind of freight is transported, how it is handled on land and at sea, and how efficiently it can be handled in port.
When the Suez and Panama Canals opened in 1869 and 1914 respectively, they changed where ships would travel, and therefore where strategic positions of ports would be - giving incentive for growth and the establishment of new ports in some places, and their shutdown in others.

At the same time, type of transportation means available on land are also of equal importance to port development.



PORTS:
LOCATION



I.1 LOCATION

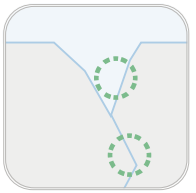
OVERVIEW

Inland Port:
An Inland port is a port on a navigable lake, river (fluvial port), or canal with eventual access to a sea or ocean. Linked to a major river, often serving a vast hinterland.

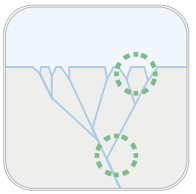
Sea Port:
A port that has direct access to the sea.

SEA PORT
A port with direct access to the sea.

RIVER ESTUARY
A port with direct access to river and to the sea.

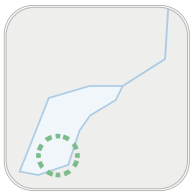


RIVER DELTA
A port with direct sea access, located on a river delta.



ALONG A RIVER
A port with direct access to a river.

ON A LAKE OR CANAL
A port directly accessing either a canal or a lake.



INLAND PORTS

PORTS: LOCATION

SEA PORT

The location of a port, whether on the coast or along a river, serves as a basis not only for typological classification but also for determining its intended use, size, and amenities.

Danube Delta. Romania/Ukraine. Source: Google Earth.

Estuary, Río de la Plata, Uruguay. Source: Wikimedia Commons, eol.jsc.nasa.gov.

PORTS:
LOCATION

IN OR NEAR AN ESTUARY

An estuary is a unique body of water where freshwater from rivers and streams merges with seawater. These areas, along with their surrounding lands, act as transitional zones between land and sea, and between freshwater and saltwater. Despite being influenced by tides, estuaries are shielded from the full impact of ocean waves, winds, and storms by natural barriers such as reefs, barrier islands, or land formations made of mud or sand. Additionally, the sheltered coastal waters of estuaries play a crucial role in supporting public infrastructure, functioning as essential harbors and ports for shipping and transportation.

FEATURES

New York / San Fransisco

New York Harbor, USA.
Source: Wikimedia Commons, Noaa.

San Francisco Harbor, California, USA. Source: Wikimedia Commons, U.S. Naval History and Heritage Command.

PORTS: LOCATION

IN A DELTA OR ON ITS MARGINS

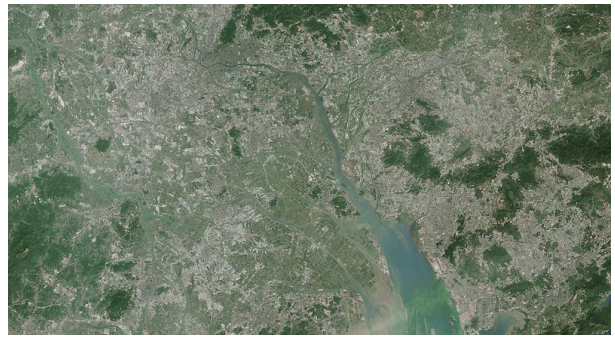
A river delta is a landform found at the mouth of a river, where it flows into a larger body of water such as an ocean, sea, estuary, lake, or reservoir. Deltas form from the deposition of sediment carried by the river as it enters the larger body of water. Over time, these deposits create the distinctive geographic pattern of a river delta.

For thousands of years, river deltas have been crucial to human civilizations due to their extremely fertile soils. Major ancient civilizations, like those along the Nile and Tigris-Euphrates rivers, thrived in these regions and adapted to their natural flooding cycles. It is widely believed that the ancient Greek historian Herodotus coined the term “delta” nearly 2,500 years ago, inspired by the shape of many deltas resembling the Greek letter delta (Δ) (Encyclopedia Britannica).

Today, deltas continue to be significant for humans. They are valuable sources of sand and gravel, which are essential materials for constructing highways, buildings, and other infrastructure. Additionally, delta lands are important for agriculture. For instance, the Sacramento-San Joaquin Delta in California is one of the state’s most agriculturally productive areas.

FEATURES

Pearl River Delta / Yangtze River Delta



Pearl River Delta, China. Source: Wikimedia Commons, Earth Observatory – NASA, Adam Voiland.

Yangtze River Delta, China. Source: Google Earth.

PORTS:
LOCATION

ALONG A RIVER

Port of Vienna, Austria. Source: Google Earth.

Port of Rotterdam, Netherlands. Source: Wikimedia Commons, Dkvtig.

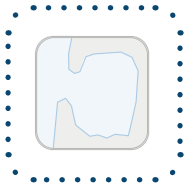
PORTS: LOCATION

ON A LAKE / CANAL

Two Harbors Minnesota, Lake superior, USA.
Source: Wikimedia Commons, U.S. Army Corps of Engineers.

Two Harbors Minnesota, Lake superior, USA.
Source: Wikimedia Commons, U.S. Army Corps of Engineers.

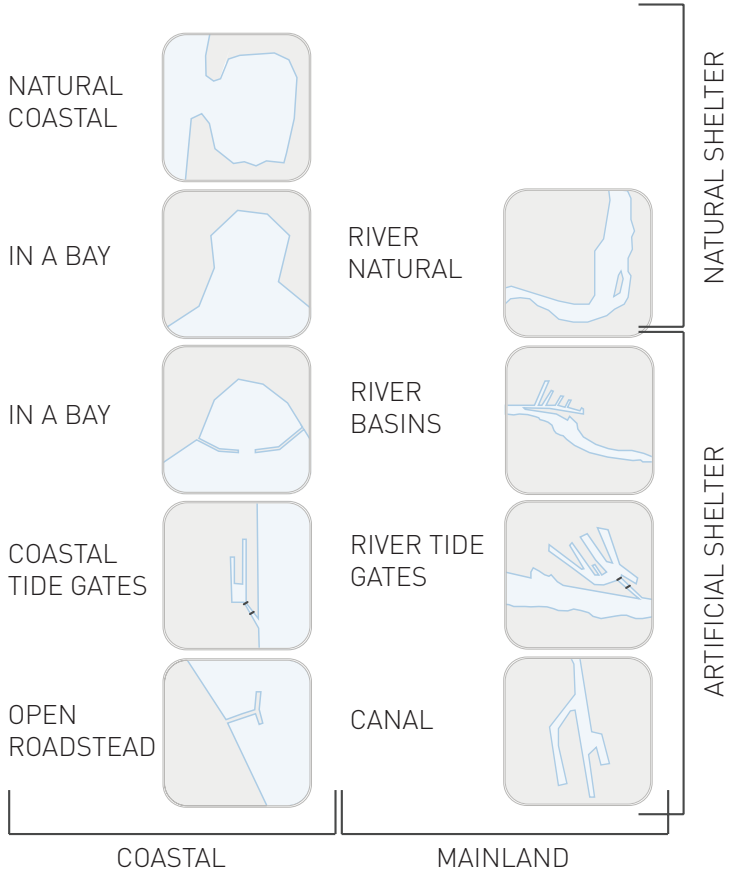
PORTS:
SHELTER



I.2 TYPE OF SHELTER

OVERVIEW

Harbor: A harbor is a water area where ships, boats, and barges can find refuge from rough weather or be stored for later use. This protection can be either naturally occurring or artificially created. Harbors can be situated along coastlines adjacent to seas or oceans, or they can be located inland along rivers or lakes.



PORTS:
SHELTER

NATURAL COASTAL

A natural harbor is a landform where a section of a body of water is both protected and deep enough to allow anchorage. Many such harbors are found in rias, which are drowned lower portions of river valleys. These harbors are characterized by deep water sheltered by the surrounding land, providing safe anchorage for ships. Sydney Bay in Sydney, Australia, is a prime example, being the world's largest natural harbor.

Natural harbors have historically been of great strategic naval and economic importance, with many major cities situated on them. The protection offered by natural harbors reduces or eliminates the need for breakwaters, resulting in calmer waves within the harbor.

Koyilandy Harbour, Kerala, India. Source: Wikimedia Commons, Vengolis.

PORTS:
SHELTER

IN A BAY

A bay is a sizable body of water connected to an ocean or sea, typically formed by an inlet of land that blocks some waves and often reduces winds. Bays can also be found inland as inlets to larger bodies of water, such as lakes or river estuaries, like those around the Great Lakes in North America or the Parramatta River in Australia. Large bays may be referred to as gulfs, seas, sounds, or bights. A cove is a small, circular or oval coastal inlet with a narrow entrance, while a fjord is a steep bay shaped by glacial activity.

Historically, bays have been crucial for human settlement, providing safe fishing areas. They later became important for sea trade, as their safe anchorage made them ideal locations for ports.

Donostia-San Sebastian, Spain.
Source: Wikimedia Commons, Hynek Moravec; modified by Generalpoteito.

PORTS:
SHELTER

CASE STUDY: BREAKWATERS

Breakwaters are coastal structures built to shield against weather and longshore drift or to protect anchorages. They can be connected to the shore, often called sea walls, or placed offshore, typically 100 to 600 meters from the coastline. Offshore breakwaters are classified into two main types: single, which is a continuous barrier, and multiple, which consist of several barriers with gaps of 50 to 300 meters between them, influenced by wave interactions.

Breakwaters can be fixed or floating, and may be impermeable or permeable to allow sediment transfer shoreward, depending on tidal range and water depth. They are usually made from large rocks, such as granite, weighing up to 16 tonnes, or from rubble mounds. Their design considers the angle of wave approach and other environmental factors. Construction can be parallel or perpendicular to the coast, based on shoreline needs.

These structures absorb wave energy through mass (e.g., caissons) or a revetment slope (e.g., rock or concrete armor units). In coastal engineering, a revetment is land-backed, while a breakwater is sea-backed, with water on both sides.

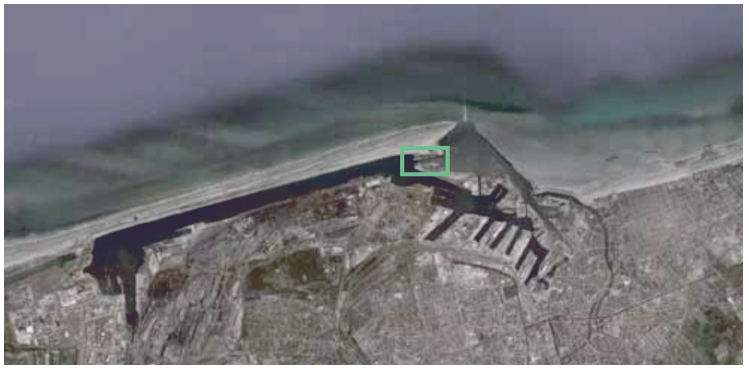
Port of Dover. UK. Source: Google Maps.

PORTS:
SHELTER

CASE STUDY: COASTAL TIDAL GATES

A natural opening that allows water to flow freely in one direction with the changing tides, but automatically closes to prevent backflow. These openings serve to mitigate tidal effects and facilitate varying water levels for docking ships.

Thames Barrier, London, UK. Source: Wikimedia Commons, Andy Roberts.



Port of Dunkerque, France. Source: Google Maps.

PORTS:
SHELTER

CASE STUDY: OPEN ROADSTEAD

A roadstead serves as a safe anchorage for ships awaiting entry into a port or forming a convoy. When well-sheltered and conveniently located, it can facilitate the transshipment of goods, stores, and troops, either individually or together.

Port of Cagliari, Italy. Source: Google Maps

PORTS:
SHELTER

CASE STUDY: RIVER TIDE GATES

A river tide gate is a controlled opening that permits water to flow freely in one direction with the tide, but automatically closes to prevent reverse flow. Similar to previous examples, these gates help mitigate the effects of tides upriver and maintain different water levels for docked ships.

Port of Liverpool, UK. Source: Google Maps.

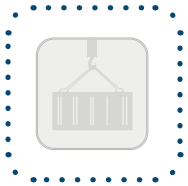
PORTS: SHELTER

CASE STUDY: CANAL

A canal is a man-made waterway designed to enable boats and ships to travel between different bodies of water. These structures facilitate vertical movement from higher to lower water levels, or vice versa. Additionally, canals are used to transport water for irrigation and various other human needs.

Port of Ghent, Belgium. Source: Google Maps.

PORTS:
TYPE OF GOODS



I.3 TYPE OF GOODS

The type of goods or freight that runs through a port, has a high impact on its layout and architecture. Fishing ports are often smaller, and specialized in the handling of fish. Passenger ports are often specifically designed for cruise or travel purposes, but also often located near or at ports for different purposes. Cargo ports often handle all types of cargo - both containers and bulk.

Ports can be specialized in the type of goods they handle, but many are designed to cater any type of goods, thus becoming Hybrid ports.

Many ports handle all kinds of cargo, as well as passengers, but they often do so in different locations or terminals that are specialized for the goods they handle. Thus, they may appear as hybrid ports, but in fact the architecture is specialized in each location.

FISHING PORT
A port designated for the receiving and handling of fish.

BULK PORT
A port handling goods that is not transported in containers.

CONTAINER PORT
A port for the transshipment of freight carried in containers.

CARGO PORTS

PASSENGER PORT
A port where people embark and disembark sea transportation.

PORTS:
TYPE OF GOODS

FISHING PORT

A fishing port is a specialized harbor or port dedicated to the landing, sorting, and distribution of fish. Typically commercial in nature, it is unique in its reliance on ocean products. The fishing port serves as a crucial link between the capture of fish and their eventual consumption. Unfortunately, these ports often become hotspots for pollution, affecting both the surrounding environment and the fishery products. Additionally, fishing harbors can significantly impact the physical and biological aspects of coastal environments.

Lofotfisket, Norway. Source: Wikimedia Commons, Kristian Magnus Kanstad.

PORTS:
TYPE OF GOODS

BULK PORT

A bulk port is designed to handle various types of bulk freight, which includes grains, liquid fuels, chemicals, wood, and automobiles. This diversity necessitates multiple handling methods.

Bulk cargo refers to unpackaged commodities transported in large quantities and can be classified as either “liquid” or “dry.” Here are some examples:

Automobiles:	Typically transported on specialized roll-on/roll-off ships.
Break Bulk Cargo:	Items stacked on pallets and moved using cranes, either on land or onboard the ship.
Bulk Cargo:	Commodities like salt, oil, scrap metal, aluminum, grain, and logs, which are not on pallets or in containers.
Project Cargo:	Oversized and heavy items, such as factory components or wind turbines, handled individually by cranes.

Bulk cargo handling systems include stationary machinery like conveyor belts, screw containers, stackers, and bucket elevators, as well as mobile equipment like loaders and shuttles. Storage facilities may consist of stockyards, silos, and stockpiles.

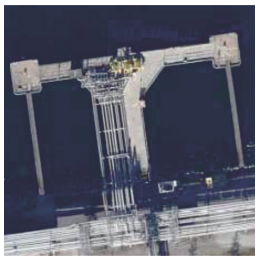
The layout of a bulk port is influenced by the type of bulk freight, the machinery used, storage solutions, and other transportation methods (rail, road, air), as well as the relationships between these elements.

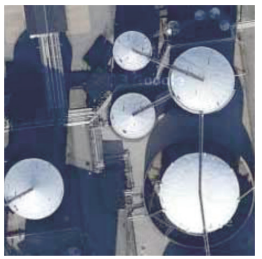

Grain, ex: Rotterdam, m=1:2 500


Handling: excavator


Quay - crane - storage

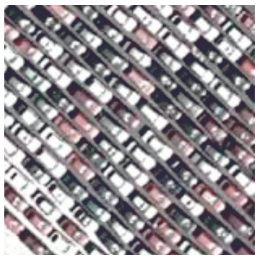

Oil, ex: Malmö, m=1:10 000


Handling: pump and pipes


Storage: oil tanks


Ro-ro, ex: Malmö, m=1:4 000


Roll-on/roll-off ramp on boat


Storage

Source: Google Maps.

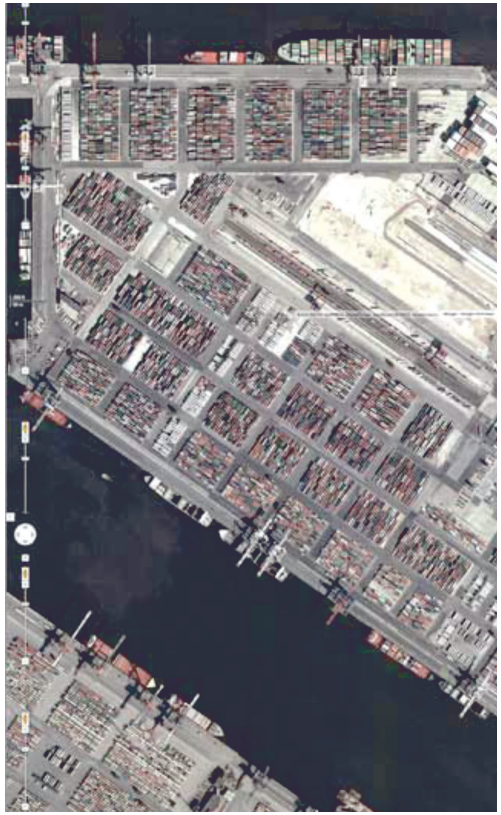
PORTS:
TYPE OF GOODS

CONTAINER PORT

A container port specializes in the transshipment of goods transported in standardized containers made of weathered steel. These containers can be efficiently loaded, unloaded, stacked, and transported over long distances. They can be transferred seamlessly between different modes of transport—container ships, rail flatcars, and semi-trailer trucks—without being opened, ensuring the goods remain untouched during transit.

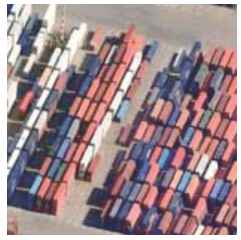
The advent of containerization after World War II significantly boosted global trade. It allowed for the transport of large quantities of goods in sealed containers, which were previously handled as break bulk cargo. This innovation reduced transport costs, minimized the need for warehousing, decreased port congestion, sped up shipment sorting, and lowered losses from damage and theft.

Container handling is fully mechanized, utilizing cranes and forklift trucks. The infrastructure of a container port includes cranes for lifting containers, stacks for storage, and trucks for moving containers around the port.

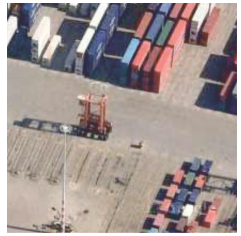


Port of Hamburg, Container Harbor, Germany.
Source: Google Maps.

Container ship & girder cranes



Storage: container stacks



Handling: trucklifts (truck/train)

PORTS:
TYPE OF GOODS

PASSENGER PORT

Cruise Ports: A cruise home port is where passengers board (embark) at the start of their cruise and disembark at the end. It's also where the ship's supplies, including fresh water, fuel, food, and other necessities, are loaded.

Cruise Port of Call: A port of call is an intermediate stop on a ship's itinerary, which can include several ports. For cargo ships, it's a place to take on supplies or fuel and handle cargo. For cruise ships, it's a key stop where passengers can enjoy their vacation.

Passenger Port: This is where people transition between sea and land transportation. Passenger ports handle the embarking and disembarking of sea travelers. They can be large, busy cruise ports or smaller ports for everyday commuters using express ferries. These ports are designed with facilities for passengers, such as kiosks, toilets, bus terminals, souvenir shops, and hotels.

Gruž, Dubrovnik, Croatia.
Source: Wikimedia Commons, László Szalai.

Kiel Harbour, Germany.
Source: Wikimedia Commons, Klaas Ole Kürtz.

Kaohsiung Port, Taiwan. Source: Wikimedia Commons, Kaohsiung City Government.

PORTS:
INFRASTRUCTURAL CATEGORY

OVERVIEW

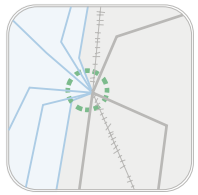
There a different ways of organizing the ports in different countries, and the process, because of its importance, is often politiscised, and things can often change quite rapidly. Nevertheless, to fully understand why a certain port is the way it is, it is important to relate it to its regional, national and international importance.

Here, exemplified by the Norwegian Harbor Hierarchy:

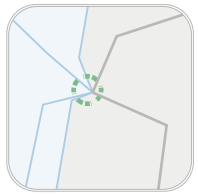
The Norwegian harbors are structured under a hierarchy of harbors related to their national and regional importance.

The term 'harbor' is multifaceted, but the essence of what is to be considered a harbour by the law is, however, quite clear. A harbor functions in relation to loading, unloading and handling of goods and/or people, and/or as places for landing or tying-up (in conjunction with the practice of fishing). Thus, the Law about Harbors and Waters concern harbours that attend to the interests of the general transport network, and not e.g leisure harbors, or single mooring installations.

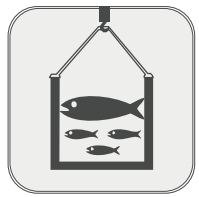
APPOINTED PORT
Ports with particular importance.



BACKBONE PORT
Ports with connection to the main national road system.



FISHING PORT
Ports with a specialized focus on the handling of fish.



PORTS:
INFRASTRUCTURAL CATEGORY

Appointed ports

The main national ports with particular importance to the development of an efficient and secure maritime transportation of people and goods.

There are 7 appointed harbors (as of December, 2013).

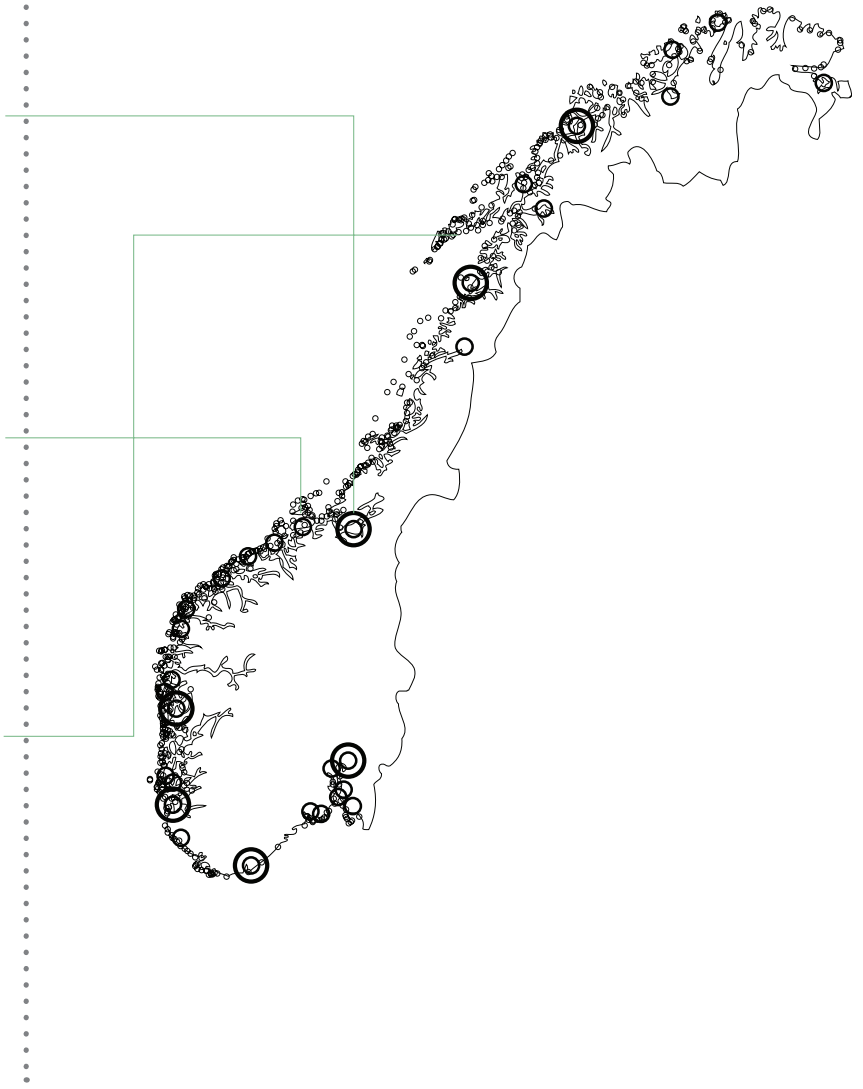
Backbone Port

Ports with connection to the main national roads through the National Transport Plan and to the main seaway network at sea, securing efficient and sufficient handling of people and goods.

There are 32 backbone harbors (as of December, 2013).

Fishing Port

Fishing Ports are of particular national interest as investment areas. There are two reasons for this - fish are an important export product - preservation of the main features and settlement pattern - tradition.



PORTS:
INFRASTRUCTURAL CATEGORY

CASE STUDY: TRONDHEIM HAVN

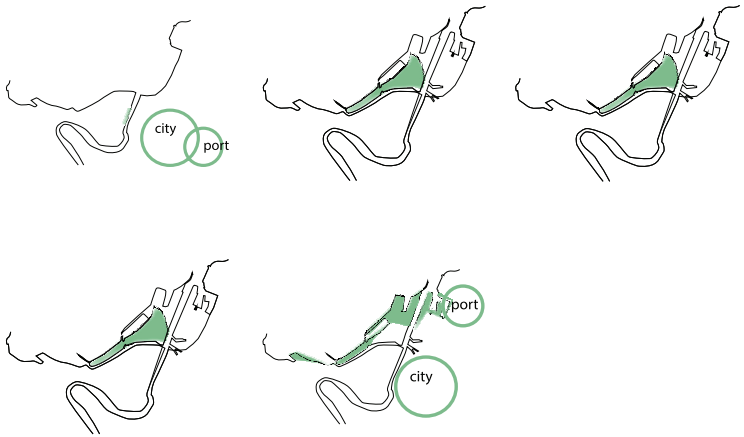
"Trondheim havn" is an important hub in the middle part of Norway. In 2010, it had 4555 calls and handled a gross tonnage of 16,5 million tonnes. The amount of freight was 2 million tonnes.

The port handles many different types of freight, as well as different types of passengers. From this one might conclude that it is a hybrid port, but in fact the different freight and types of passengers are assigned to very different, specified areas of the port

Cruise ship calls: 48 / Cruise ship passengers: 78 500 (2013)

Total pier length: 6 316 m

Trondheim Harbor, Norway. Source: Google Maps.



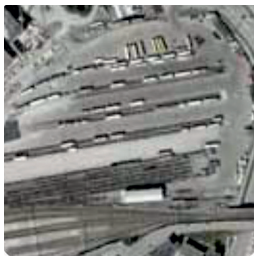
I
PORTS

I 1.
LOCATION

I 2.
TYPE OF
SHELTER

I 3.
TYPE OF
GOODS

I 4.
INFRASTRUCTURAL
CATEGORY



HURTIGRUTA
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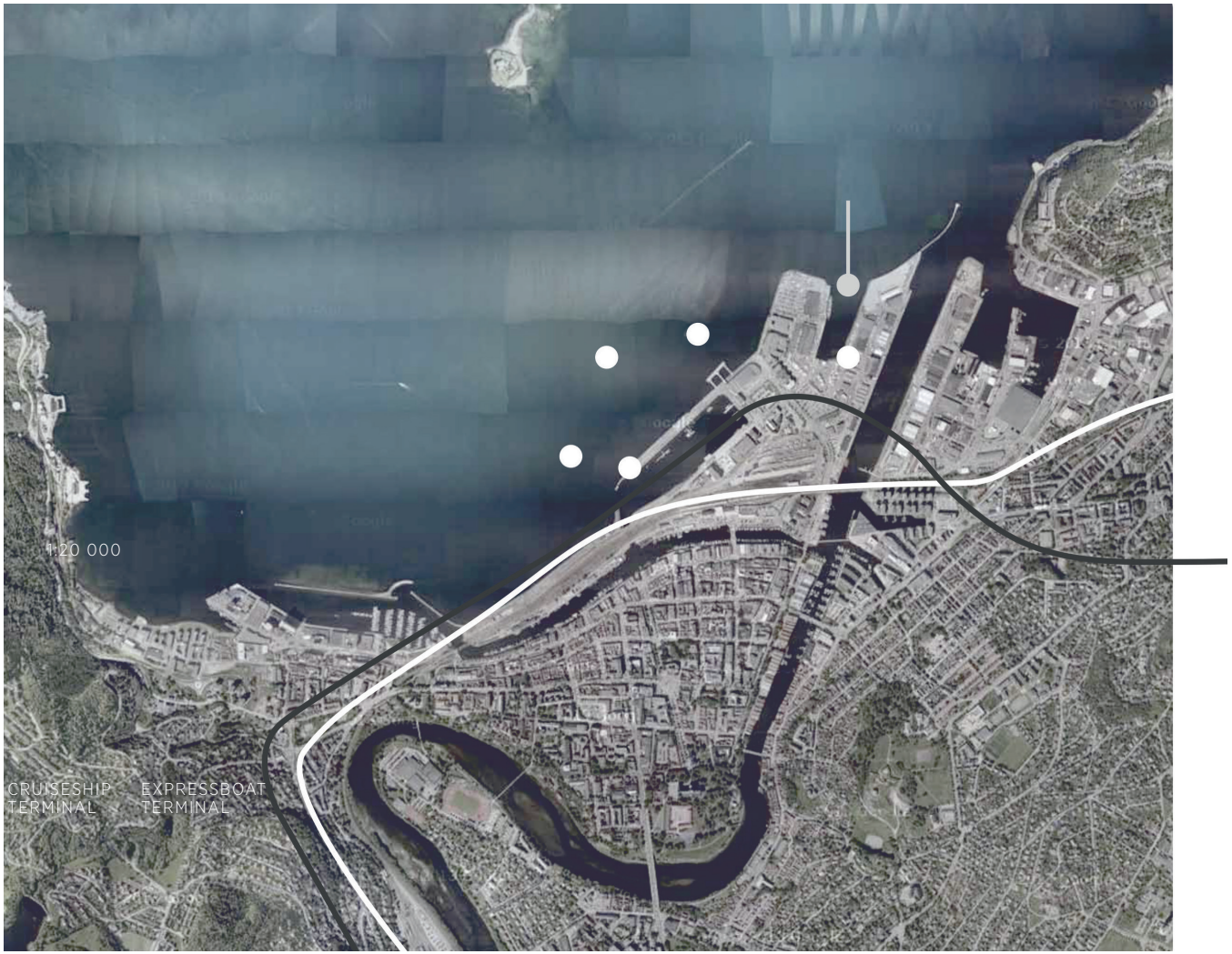


Trondheim Harbor, Norway. Source: Google Maps.

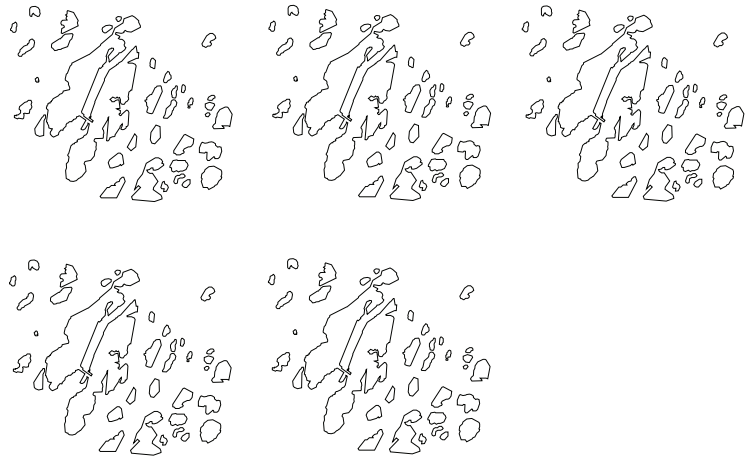
PORTS:
INFRASTRUCTURAL CATEGORY

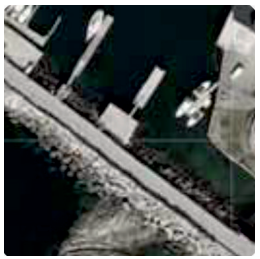
CASE STUDY: HENNINGSVÆR HARBOR

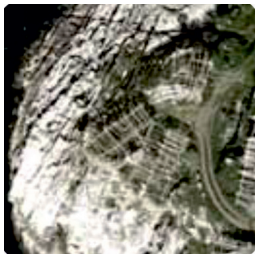
"With the mountain at its back and the sea on three sides, Henningsvær had the natural prerequisite to be center of the Lofot-fishery, and during the 1800s the island society grew and became the most important fisherman place of the Lofoten islands. In contrary to many other fisherman villages Henningsvær has not been vacated, there are still 500 people living there."
(Henningsvar)

"Henningsvær was populated during the 1700s, The place ought to be important before; one of Norways oldest skis was found near Henningsvær and was C-14-dated to be ca. 2000 years old. Henrik Drejer bought the place 1842 for 6000 speciedaler. Under his lead Henningsvær manifested its position as the leading fisherman village on Lofoten island, with doctor, chapel and light-tower. He had no heirs and Henningsvær was bought by Nordlands Amtskommune, mainly to prevent it being bought by foreigners. In 1922 Henningsvær got electricity, and some years afterwards drinking water supply from the mainland. The fisherman village is built on islets and skerries, with jetties and landfills and is surrounded by sea on all sides. The main breakwater construction was finished in 1934, between the two islands Heimøya and Hellandsøya. This gave the harbor protection from south-west. Before 1960, the only connection to the surrounding world was by boat to Kabelvåg and Svolvær. After 1960 the road 816 to Festvåg was opened, followed by ferries between Festvåg and Henningsvær. In 1963 the Henningsværbridge opened and connected Henningsvær to the rest of the Lofoten island."
(Wikipedia)
Concentrated - buildings stand quite dens along waterfront.

Henningsvær Harbor, Norway. Source: Google Maps







Henningsvær Harbor, Norway. Source: Google Maps

PORTS:
INFRASTRUCTURAL CATEGORY

CASE STUDY: ROTTERDAM

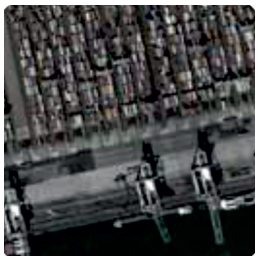
The Port of Rotterdam, situated in Rotterdam, Netherlands, is the largest port in Europe. It was the world's busiest port from 1962 until 2002, before being overtaken by Singapore and later Shanghai. Covering 105 square kilometers (41 square miles), the port stretches over 40 kilometers (25 miles).

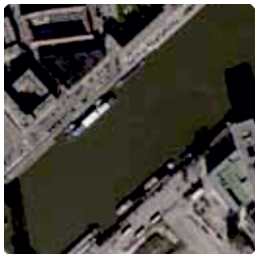
The port includes several areas: the historic harbor area in the city center, Delfshaven, the Maashaven/Rijnhaven/Feijenoord complex, and the harbors around Nieuw-Mathenesse, Waalhaven, Vondelingenplaat, Eemhaven, Botlek, and Europoort. It also features the reclaimed Maasvlakte area, which extends into the North Sea, and is located along the Calandkanaal, Nieuwe Waterweg, and Scheur (continuations of the Nieuwe Maas).

Rotterdam's port is divided into five distinct areas and three distribution parks, serving a hinterland with 40 million consumers. Key industries include the petrochemical sector and general cargo transshipment facilities. The port is a vital transit point for bulk and other goods between Europe and the rest of the world, with goods transported by ship, river barge, train, or road.

Since 2000, the Betuweroute, a fast cargo railway from Rotterdam to Germany, has been under construction, with the Dutch section opening in 2007. Additionally, large oil refineries are located west of the city. The Maas and Rhine rivers provide excellent access to the hinterland. (Portsharbor)

Port of Rotterdam, Netherlands. Source: Google Maps.





Port of Rotterdam, Netherlands. Source: Google Maps.

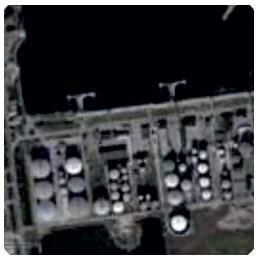
PORTS:
INFRASTRUCTURAL CATEGORY

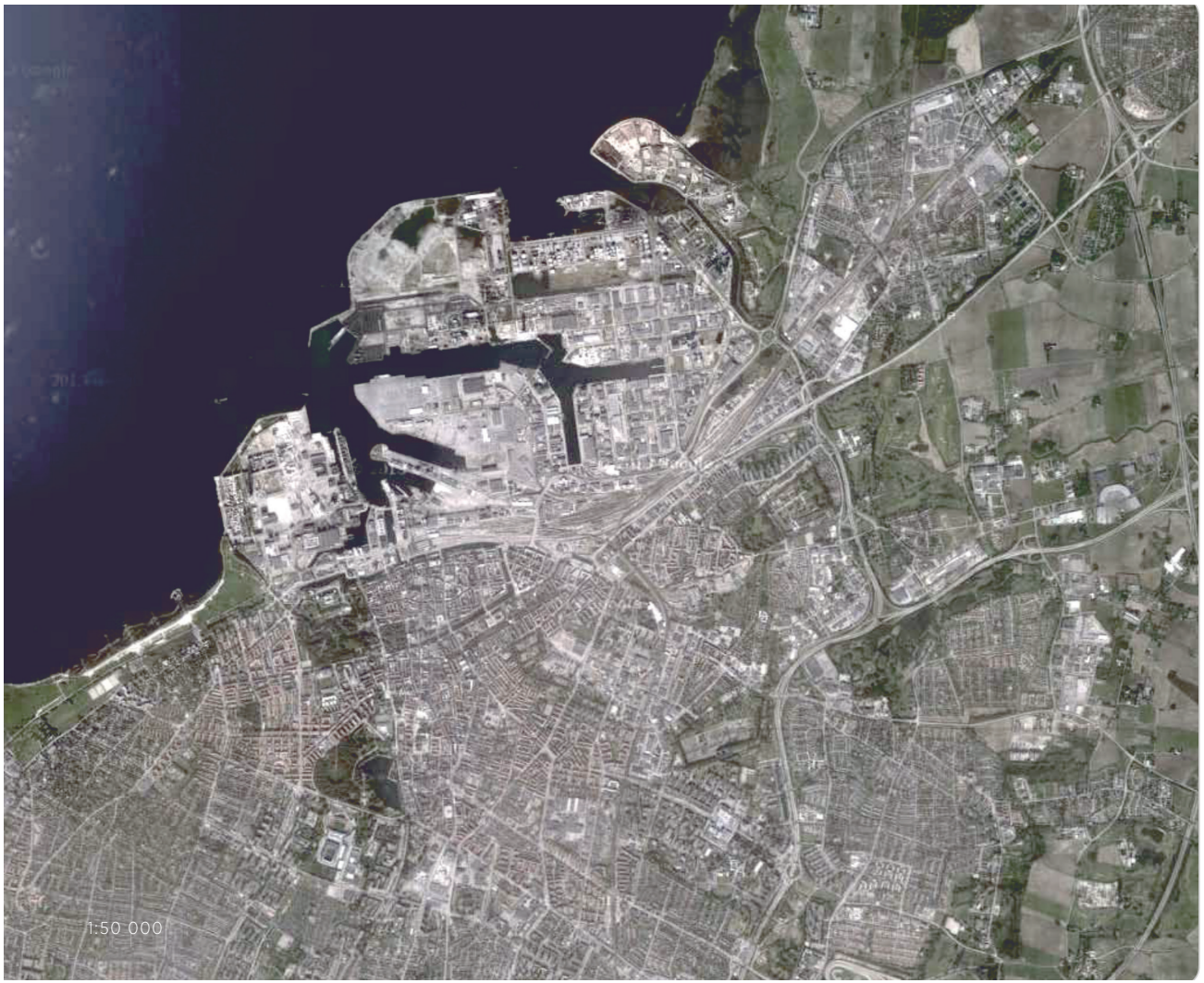
CASE STUDY: MALMÖ

"Malmö harbor is located on a landfill area north of central Malmö. Since 2001, both Malmö and Copenhagen harbor are owned by CMP, Copenhagen Malmö Port AB. Three times a day the Nordø Links ferry leaves for Travemuende (in Germany). The import of cars is an important part of the harbor's revenue. As an example, Toyota uses the Malmö harbor to deliver cars to Scandinavia" (Wikipedia).

Malmö, one of Scandinavia's earliest and most industrialized towns, faced challenges adapting to post-industrialism. However, since the construction of the Öresund Bridge, the city has experienced a significant transformation. This includes architectural developments, the attraction of new biotech and IT companies, and an influx of students, particularly through Malmö University, which was founded in 1998

Malmö, Sweden. Source: Google Maps.





Malmö, Sweden. Source: Google Maps.

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I
PORTS

I 1.
LOCATION

I 2.
TYPE OF
SHELTER

I 3.
TYPE OF
GOODS

I 4.
INFRASTRUCTURAL
CATEGORY

PORTS:
GLOSSARY

Harbor:	A harbor (...) is a body of water where ships, boats, and barges can seek shelter from stormy weather, or else are stored for future use.
Port:	A port is a location on a coast or waterfront containing one or more harbors where ships can dock and transfer people or cargo to or from land.
Inland Port:	An Inland port is a port on a navigable lake, river (fluvial port), or canal with access to a sea or ocean
Fishing Port:	A fishing port is a port or harbour for landing and distributing fish. It is usually commercial. A fishing port is the only port that depends on an ocean product.
Dry Port:	A dry port is an inland intermodal terminal directly connected by road or rail to a seaport and operating as a centre for the trans-shipment of sea cargo to inland destinations.
Warm-water Port:	A warm water port is one where the water does not freeze in winter time.
Sea Port:	A port that has direct access to the sea.

Non-typical architectural structures

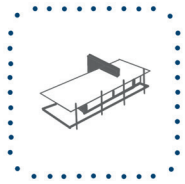
The aim of the following chapters is to acquaint readers, but mainly students of architecture, with not-so-typical architectural structures, their role, and significance in contemporary architecture.

During their education in the first and second cycle of studies, architecture students acquire knowledge from various fields and deal primarily with the most present typologies in architecture. For that reason, there is less space and time left to study the different, not-so-typical structures that occur less frequently. This does not mean, however, that it is unnecessary to valorise their impact on built and unbuilt space, economy, society, politics and an environment. What is especially important is the identification of influential factors responsible for the emergence of not-so-typical structures and the application of a methodological approach in the development of the complex design programs required for the design of these types of facilities.

In the last twenty-five years, changes in the way of life have been evident in the entire world, but also in BH. Social relations have changed and new forms of business are present. Following the global trends in education, work and economy, BH strives to approach European standards, and complexity becomes a ubiquitous determinant. Buildings that are characterized by their complexity are being built, and while some elements of the structure are known, others are completely new. Due to the specific way of interaction of these elements, the occurrence of “hybridization” occurs, which is why these objects differ from previously known and defined units. The impact of the global on the local is increasingly evident.

Pavilions

J
PAVILIONS



Aside from researching the phenomenon of the hybrid in new (architectural) structures, pavilions cannot be ignored that due to the fact that they can easily shift between artistic-temporary-architectural positions. More so, they sometimes question the very definition of architecture. Because of their role in setting new trends, artistic connotations, the message being sent, and ambivalence in the ways we use them, pavilions are interesting structures that say a lot about the times we live in. Their history goes back to the latest century, but if we go a slightly further down history lane, we can trace their development to the great 'world exhibitions', take for example on the Paxton Crystal Hall in London and the Eiffel Tower in Paris, which are perhaps the best examples of engineering talent interlinked with the building possibilities in the nineteenth century. The original purpose of such structures was of an exhibitional character, which continued into the twentieth century. Mies van der Rohe's pavilion in Barcelona is certainly the most striking example of revolutionary changes in architecture that have reflected on the whole 'Modern' direction in architecture.

From the very beginning, architecture has gone through many phases of definition and redefinition. From the Egyptian stone pyramids to the glass pyramid in the Louvre, the universal principles of construction are constantly being rediscovered, improved and upgraded. For this reason, pavilions are still as important today as they were in previous centuries. It is the same for multi-purpose buildings that have undergone a series of transformations and redefinitions, from Roman dwellings that combined housing and commerce functions, to today's hybrid structures that match entire cities. However, before qualifying not-so-typical structures, the question arises as to whether it is possible at all to categorise these objects in architectural terms.

Barcelona Pavilion, Spain. Source: Wikimedia Commons, Thierrytutin.

Barcelona Pavilion, Spain. Source: Wikimedia Commons, MartinD.

Barcelona Pavilion, Spain. Source: Wikimedia Commons, Hans Peter Schaefer.

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K
INSTALLATIONS

ARCHITECTURE AND ART IN THE 21ST CENTURY

It is often stated that generations of students who go to school today will do jobs in the future that do not exist yet. V-bloggers, influencers, professional gamers are "occupations" that did not exist at the beginning of this century. With the introduction of digital technologies to architectural offices, there was a need for new profiles. Therefore, we now have "BIM managers, modellers, facilitators, developer, analysts, etc." listed as job descriptions for architects. The first question for discussion is to what extent does digitalisation affect people's lives and education today? Information was recently published[6] that in the United Kingdom, they want to phase out analogue clocks because students are no longer able to interpret them. This is perhaps the best example of transformations in education when legitimate questions are asked about what the content of learning is, and what skills future generations need to adopt. The fact is that through digital media, students can get a lot more information than was the case twenty years ago and insisting on older methods of acquiring knowledge is certainly a complete failure. At the same time, such availability of information means nothing if it is just downloaded without critical evaluation. What has the process of digitization in architecture brought us? Today, drawing is much faster with the help of computer programs for visualizations, but in this imposed imperative of accelerated pace for project delivery, a very important period of reflection is often missing. Copying familiar elements from one project to another facilitates and speeds up the drawing process, but the question of the correctness of such an approach remains. It is not naive to assume that due to the accelerated pace contributed to digitalization, more and more design errors are occurring, so it is no wonder that even the renowned architect Santiago Calatrava is being sued for negligence (Ravenscroft, 2019), (Vora, 2022) when designing a pedestrian bridge in Venice.

Is the role of architects devalued today? We live in a time when 3D printers[7] already exist, with the help of which it is possible to build entire houses, and the question of the need for architects inevitably arises, at least in the context of prefabrication. Furthermore, we can see how artificial intelligence (AI) generates building designs based on clients' wishes and does so within minutes, compared to traditional, lengthy processes. In that respect, will it soon happen that developers take over entirely the building processes and bypass architects altogether by using these new tools?

Ponte della Costituzione, Venice, Italy. Source: Wikimedia Commons, Iha76.

Just like the situation in the automotive industry, it is possible to expect that the designed object (the house for instance) will be ordered by future tenants online, being able to define all possible settings of dispositions, colours and furniture, which will then be printed on the site. Is it a vision of the future in which the role of architects is diminishing or not? The answer can be found in the human pursuit of individuality. For example, a mechanical wristwatch that does not weigh more than 0.15 kg and is treated as a luxury item (although it may not contain precious metals)

6 *"They are used to seeing a digital representation of time on their phone, on their computer. Nearly everything they've got is digital so youngsters are just exposed to time being given digitally everywhere." (Malcolm Trobe, the Deputy General Secretary for the Association of School and College Leaders (ASCL))*

7 https://www.youtube.com/watch?v=wCzS2FZoB-I

easily achieves a value of several thousand euros. If we compare this watch, which measures time relatively accurately,[8] with a car that weighs more than 1000 kg and is worth the same amount of money and contains a digital watch as standard equipment (which is far more accurate than an ordinary mechanical one), the question remains: why is this the case? The process of making a watch that contains hundreds of parts is incomparable with the complexities of making a car and thousands of parts and all its components with the necessary knowledge to make it. Despite so many differences and the cost of the materials used, why is the price is almost the same!?

This is where the uniqueness and limitations of the series come under the spotlight, as well as the issue of prestige and status symbols that people aspire to. Because of this characteristic, architects will always have work to do, because of the need to live in differing houses, designed according to the individual requirements of the users will still be present. At least, that is a comforting thought. A house containing designed furniture and a selection of works of art by certain authors will always be the subject of aspiration, if nothing else by other architects.

8 With the most precise mechanical, analogue clocks, the tolerance threshold is +/-2 seconds per day, while with digital clocks it is +/-15 seconds per month.

THE BOUNDARIES BETWEEN WORKS OF ART AND ARCHITECTURAL WORKS

Thinking about not-so-typical structures begins with the need to set boundaries, because if they are not typical objects/spaces, how then to qualify them and distinguish them from works of art? What is the difference between an architectural object and an art installation? If there are any differences at all, is it possible to expect a convergence of artistic and architectural approaches in space? Can it be argued that the architectural approach to an art installation promotes a utilitarian character, in addition to the idea and message?

As in any other discipline, art is evolving, so in addition to traditional categories, such as painting or sculpture in the 20th century, new forms are emerging that cannot be classified into existing categories. This is how art installations were created that go beyond the framework of sculpture and begin to encompass space. In order to understand their origin, it is necessary to turn to the essence of works of art, and this is possible through "anatomical dissection".

What is art today? According to Marshall McLuhan, "*art is anything you can get away with*" (Lawson, 2001, p. 3). This thesis is supported by the work of 27-year-old artist Lana Newstrom, who says that she is the first author in the world to create invisible art for which collectors are willing to pay a million dollars.[9] Is it then art to sell something that does not exist in the physical world? Is selling "mist" a new art form today? Is the same true for architecture: can we sell virtual houses instead of real ones today?

9 https://www.youtube.com/watch?v=aKAk-0B61XM

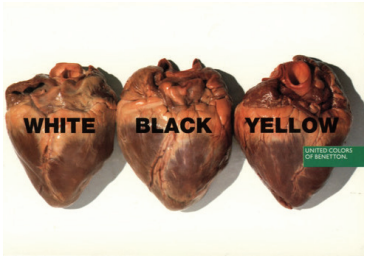
K INSTALLATIONS

Riverside Museum, Glasgow, Scotland. Source: Openverse, Neillwphoto.

Unlike an architectural work, understanding a work of art often requires a little more information than mere visual observation. Tvrtko Kulenović believes that the artistic message is polysemic in its nature (Kulenović, 1982, p. 97) and if we keep in mind some of the basic tenets of information theory[10] (Raljević, 2001, p. 29), then it is clear why this is so. In the process of communication, we have a sender or an artist, and a recipient or an observer. The artist sends a certain message, and the value of the message is information. However, the most important component is the emotion (impression, experience) that the work of art leaves to the observer. For these reasons, the artistic message is ambiguous, primarily due to the individuality of the observer, because the same message can always be interpreted differently by other "consumers". One of the most striking ways artists have recently communicated with consumers was a campaign initiated by *United Colors of Benetton* through shocking photos and their accompanying messages and slogans. The goal was achieved because it drew attention to certain problematic issues and raised people's awareness of social problems.

Communication between the artist and the observer often takes place through forms, signs and symbols, i.e. elements that are inherent in the language, so a comparison with the structure of the language is not excluded. Language is a system of signs and signs have their geometric determinants. For example, a circle can be interpreted in several ways so that the shape of the circle at one point becomes the letter "O" or perhaps the number zero ("0"). If we combine letters and numbers like H_2O then we will get a chemical symbol for water. However, O_2 can be something other than an interpretation in the context of chemistry, something like a mobile operator in England or the Arena Centre in London. Context is extremely important in understanding both a work of art, and an architectural work. In art, back in 1917, Marcel Duchamp, with his work "Fountain", problematized what a work of art is and what to do with it, emphasizing the importance of the context that gives value to this work of art (Tate Modern, 2019).

Benetton Adverts. Source: Flickr, Alfryer.



Benetton Adverts. Source: Flickr, James Lackey.

10 "From the cybernetic point of view, there is no significant difference in the nature of utilitarian and aesthetic information: the maximum of utilitarian information gives a feeling of pleasantness, the minimum leaves the impression of unpleasantness - either the object is inappropriate for the subject, someone else's, or, on the contrary, it is known to such an extent that saturation has occurred - which, in principle, also applies to aesthetic information where the maximum and minimum aesthetic signal correspond to the achieved level of aesthetic communication between the object and the subject..." (Raljević, 2001, p. 29)

THE LANGUAGE OF ART AND ARCHITECTURE

Academic Tvrtko Kulenović explains what the language of art is: *"Artistic language is one that deliberately digs into the subconscious, and* deliberately *strives for ambiguity."* (Kulenović, 1982, p. 103) and for information on what kind of architectural language it can serve, one can use Meyer's description: *"Architectural language is a "deviant" language, a language that arises from the introduction of certain deviations from established tendencies, or perceptual norms."* (Meyer, 1986, p. 47)

Metaphors, associations and imitations are often used in architecture as a form of communication with the observer. A good example is Le Corbusier's chapel Roschamp, which at one point is associated with folded hands in prayer, at another moment on a boat, in the third on a sitting duck or a nun's hat. Foster & Partners designed a business tower in London (30 St Mary Axe - The Gherkin) that resembles a pinecone or a bullet. The Aldar real estate headquarters in Abu Dhabi is built in the shape of a coin and is a direct link to the financial nature of the investment and real estate company. The associative connection can also be recognized in the buildings in Baku called Flame Towers, which glow at night in a way that dynamic lights form a flame (the Azeri national symbol), but also displays other moving images. The conceptual work of the Bjarka Ingels Group (BIG) of Cross Towers is associated with the computer symbol "#" (hashtag).

However, there are enough imitations in architecture that do not make too much sense and negatively affect the image of the profession. It suffices to cite the example of Indira Gandhi Planetarium in India. It looks like Saturn because of the rings of different colours that surround the ball, and the "only" mistake is that Saturn has seven rings and the building has only five. Alternatively, another example is the building of the National Committee for Fisheries Development in India, which looks more like a children's entertainment centre than an administrative building.

If we compare an architectural work with linguistic structures or syntax, we can recognize the following rules that apply: gravity and geometry, which are impossible to ignore as long as something is built on planet Earth. Also, we can spot elements like lines, surfaces and volume which are equivalent to words that with certain attributes become windows, walls, ceilings. Semantic meaning is often used in describing architectural elements, so they qualify as strong, simple, "masculine" or delicate, subtle, "feminine".

When an author deviates from the rules in language, we will state that he is illiterate, however in architecture and art this may not be the case. Jacques Derrida's deconstructivism theory has found fertile ground with architects such as Daniel Libeskind, whose buildings often defy "grammar." Hundertwasser designed a residential building in Vienna in which he denies flat surfaces in a horizontal sense, which makes it very difficult to move on the floors and raises the question of the practicality of such an intervention, although it mimics natural topography. Contemporary architects with their virtuoso compositions conditionally deny gravity and manipulate visual balance.

The Gherkin and the Lloyd's Building, London. Source: Openverse, It's No Game.

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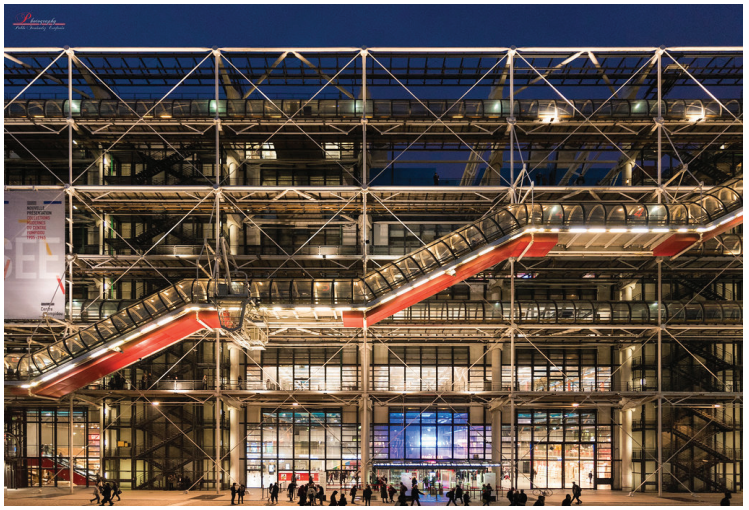
ARTISTIC VS. ARCHITECTURAL INSTALLATIONS

Today, there is no longer an architectural exclusivity when it comes to designing a space. Artists have long stepped into these spaces, using art installations.

Artistic installation is a term that refers to art into which the observer physically enters, and which is often characterized by terms such as: theatrical, engaging, or experiential (Bishop, 2005). An art installation creates a situation in which the observer physically enters and it acts on the observer in such a way that they perceive it as a unique whole. An art installation is secondary in importance to the individual work it contains, while in the case of artistic installation, the space and manner of arrangement of elements in it, are considered as a whole and as a single entity.

In the case of architectural structures, there is no imperative message to be sent and the best illustration of this difference between artistic and architectural approach can be found by comparing the works of architect Zaha Hadid and artist Pipilotti Rist. Zaha Hadid created three identical canvas structures - “petals” placed around a central point that originate from complex natural geometric shapes such as flower petals and leaves (Mairs, 2016). The message, if it exists, is not evident unlike the other example where the artist covers the entire part of the neighbourhood with a red carpet (A’design award & competition, 2024). In this case, visitors are wondering why the spaces and facilities in front of the bank are completely covered with carpet? The answer is because there was an art colony on that site, which was removed due to the need to build a bank. Symbolically, the artist’s message was that all the sins of the bank are swept under the rug.



Georges Pompidou Centre, Paris. Source: Openverse, Hadock.

ARCHITECTURE AND EMOTIONS

Architecture constantly balances engineering (construction/structural) component and art, and there are few attempts to absolutely define an architectural work.

"*Architecture today can be most accurately defined as what counts with the interior space. Beautiful architecture will be one that provides an attractive interior space, a space that ennobles us, conquers us spiritually; ugly, on the other hand, the architecture will be the one with a boring and repulsive interior space. But it is important to establish that everything that does not have interior space is not architecture.*" (Zevi, 2000, pg. 25).

In Zevi's thinking, the component of emotion is noticeable, i.e. the impact of the work on the observer. The importance of emotion that arises as a reaction to a shaped space can be illustrated by the example of the Holocaust Museum in Berlin and the Morgue in Portugal.

Jewish Museum, Berlin. Source: Wikimedia Commons, Studio Daniel Libeskind.

Jewish Museum, Berlin. Source: Wikimedia Commons, Studio Daniel Libeskind.

Architect Daniel Liebeskind designed the museum space in a way that it tells 3 stories (Jewish Museum Berlin, 2001). Those stories are represented though paths that lead from the entrance hall. For the first time visitors, it may seem confusing to navigate and choose the "right" path/lane as they enter the small hallway. This is a deliberate attempt by the architect to "press" the visitors to make a quick choice and start exploring the building without knowing which path they have chosen. The path of Holocaust, that we encounter from the entrance hall, materialises as a corridor that has a slight (downhill) slope and which directs the movement all the way to the heavy steel door at its end. Along the entire length of the hallway, there are exhibits that directly refer to people who lost their lives during the Holocaust. The slight tilt of the slope unconsciously forces us to speed up our pace and before we know it, we enter a room bounded by high concrete walls that looks like a gas chamber. At the very top of the wall, by the ceiling, there is a small opening through which light passes and voices come from outside. The visitor experiences a feeling of helplessness and isolation when staying in this room (this is just a fraction of the feelings of those people who could not escape the gas chambers). The second path represents the line of exodus, and 49 pillars have been placed in the

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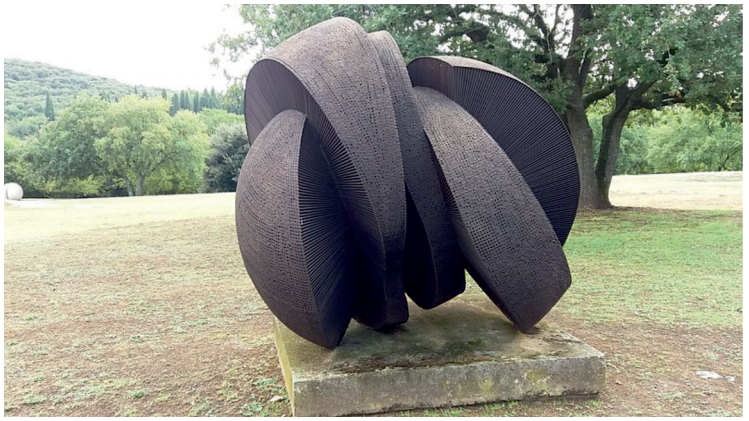
open fenced yard at the top, which represent the land from the countries to which the Jews were expelled. By placing those pillars on a sloping ramp, the architect creates an open setting through which it is difficult to move, because the balance is lost when moving and the visitor must make an extra effort to avoid hitting the walls with their shoulders. This is how the scenography was created, which influences the appearance of disorientation - the feeling that refugees encountered when coming to new places. The third line is the line of continuity, which is symbolically represented by the stairs that connect the earlier floors (history and present) and continue to climb and end in the wall. They lead upwards, to what is yet to come (the future).

Architect Jordi Badia was faced with the very demanding task of designing the city morgue in Leon (BAAS Arquitectura, 2001). The task was challenging because the planned location was inside a residential area, so at the very beginning the project provoked a reaction from the public, insofar as the tenants did not want such a structure near their homes. In this case, the creativity of the architect came to the fore, who found a way to "reconcile" the morgue building with the neighbouring residential buildings. The building is mostly buried in the ground and on the flat roof there is a biotope designed so that the sky and clouds are reflected from the water level. This is what the residents of the surrounding buildings see when they look at the morgue building. The interior of the building is not-so-typically treated so that the entrance hall and the public part of the interior looks like a living room. The intention of the author was that visitors do not feel extra stress due to staying in such a facility and that the familiar, homely atmosphere (as opposed to hospital, sterile and cold interiors), helps to deal with emotions.

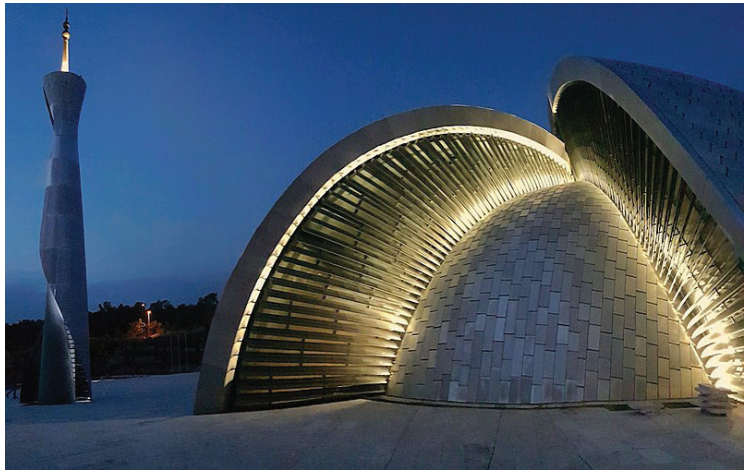
These two examples show how true architectural works have the ability to influence the emotions of the user / observer and are very much in line to what Bruno Zevi had described as a "work of architecture".

TRANSITION FROM THE DOMAIN OF SCULPTURE TO THE DOMAIN OF ARCHITECTURE

We can see many common points between art and architecture, so the next question that arises is how to determine the boundary between a work of art and an architectural work? Italian architect Massimiliano Fuksas is of the opinion that "buildings can be works of art" (PERSPECTIVE, 2018), so can the thesis be made that contemporary architectural works are also sculptures? In 1995, Christo and Jeanne-Claude transformed the famous German Reichstag building into a sculpture for a few days by covering it with canvas (Jeanne-Claude, n.d.). Symbolically, they discovered a new face of the state parliament that returned to Berlin after the unification of East and West Germany. Architect Lebbeus Woods, inspired by the war in Sarajevo, even in 1993 was thinking about architecture that accepts destruction (Woods, 2011). He saw damage on buildings and perceived it as scars but furthermore he saw those scars as design elements and sculpturally incorporated them on buildings. Artistic "excursions" into architecture and vice versa are not so rare and perhaps the best examples from former Yugoslavia are the sculptural solutions of architect Bogdan Bogdanović and the conceptual, sculptural solution of Dušan Džamonja for the Islamic religious and cultural centre in Rijeka.



A Sculpture of Dušan Džamonja, Vrsar, Croatia.
Source: Wikimedia Commons, AnToni.



A Sculpture of Dušan Džamonja, Vrsar, Croatia.
Source: Wikimedia Commons, AnToni.

Serpentine Gallery Pavillion 2006, London.
Source: Openverse, FlickrDelusions.

Pavilions, as objects/structures are for architects, challenging buildings because they imply expressiveness and can conceptually, are open for experimentation with form because the imperative of functionality is secondary. That this is true, can be seen, from the many examples of temporary pavilions built at the Serpentine Gallery in London. The tradition that began back in 2000 dictates that every year, prominent architects are invited to create an exhibition pavilion at Kensington Gardens in London (Serpentine Gallery, 2019). Exhibition, educational and public programs annually attract millions of visitors, and the pavilions themselves are an unavoidable attraction.

How much originality is there in architectural achievements today? At a time when generic architecture seems to be spreading through different parts of the world, there are rare examples of breakthroughs in architecture in terms of forms, constructions and materializations that could not have happened more than 100 years ago. A recent example that brings a necessary dose of originality is the architectural Mount Rushmore by Asif Khan (Frearson, 2014), who created a dynamic facade and thus opened the door to architecture for the application of adaptable three-dimensional facade. The facility, built in 2014 for the Sochi Winter Olympics, has no special functional role except to allow visitors to scan their faces and project them three-dimensionally on the facade of the facility, alluding to the faces of American presidents carved into the rock. It is to be expected that the system of hydraulic pistons that create three-dimensional points on the canvas (which was innovative thinking) will serve as inspiration for the development of modular elements that will meet the needs of thermal and sound insulation and as such will be applied in the future buildings.

The process of creating architectural and artistic works is almost identical. In both cases, the idea or concept is started, different presentation techniques are used to present the idea, and then the realization is approached. However, the biggest difference is the time frame in which the work is created. An architectural work is primarily the result of an order and as such implies contractual obligations to the client and very rarely arises as a result of the architect's spontaneous reaction and his or her need to construct. This is primarily due to the high cost of creating the building. There are also orders and contracts for works of art, but much more often work can result from the artist's spontaneous reaction to creation. For example, with the artist Julius Knifer, the process of making a

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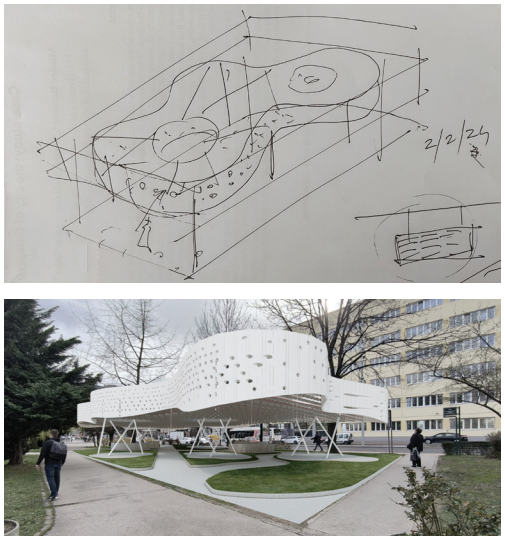
work is far more important than the result of the work itself (Purgar, 2016). Thus, the process of creating an anti-image that takes a year to complete, eventually results in a straight white line dividing the black canvas into two parts. For architects, it is required that the process of creating the work be as short as possible in order to proceed with the construction of the building as soon as possible, after the production of the necessary drawings. The process of "design" is therefore relativized because the results of the work are sought.

ARCHITECTURAL APPROACH TO CONCEPTUALIZATION

Architecture, as in the building process, is the aspiration to reconcile external inputs, function, materialization and design to create unity and bring quality to a mere structure. Like any creative act, architectural design also shows the expertise and creativity of the author and ensures that the architectural idea is a meaningful result of solving the essential external and internal factors that condition it, while preserving the originality that springs from these different conditions. Thus, Wittgenstein's definition that "*Where there is nothing to glorify there can be no architecture*" is applicable (Lawson, 2001, p. 3). Nelson Goodman points out that: "*A building is a work of art only insofar as it signifies, means, refers, symbolizes in some way*" (Lawson, 2001, p. 3).

The task of the architect is first of all to satisfy the needs of users and respond to the set conditions, so it is quite valid to conclude that the architectural approach to art installation, in addition to the artistic component, is to follow the logic of utilitarian architectural achievement.



From a sketch of the monument to the visualisation (awarded competition entry). Source: Authors

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Hybrids

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HYBRIDS

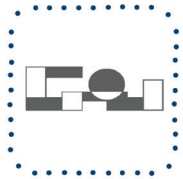
What are hybrid spaces? What are hybrid objects (buildings)? Is the footbridge, which becomes a market in the morning, serves as a studio for broadcasting radio programs during the day, and in the evening becomes a disco club, an essential transport facility, or is it something more than that? Such are the assignments given to students by professors of architecture, in order to test the limits of known typologies, because they combine different, seemingly incompatible contents. There are also many real examples, for example the model of combining school and hotel is well known. Many colleges that run curricula in the field of hospitality and tourism management have practical teaching (i.e. practice) that is conducted in facilities that are both school and hotel (ITM college). There are several advantages of this approach, and the most obvious is that students have the opportunity to deal with real tasks and practice in a real environment, whether it is culinary courses or running a hotel. The price of hotel accommodation is far more competitive than others because the workforce is partly made up of interns.

"The best way to predict the future is to invent it" (Key, 1982). This statement can be reflected in the work of Steven Holl, who is one of the most famous contemporary architects to deal with the topic of hybrids through theoretical and practical works. His 2009 Link Hybrid facility, built in Beijing, represents a vision of cities in the future (Holl, 2019). One such building with its dimensions and content becomes the equivalent of a smaller city. Paraphrasing Key, Steven Holl's work on hybrids reveals the future of big cities.

When it comes to hybrids in architecture, there are several definitions and categorizations. In order to clarify the phenomenology of hybrids in modern architecture, a brief overview of this topic is given here according to the following questions:

- What does "hybrid" mean in terms of architecture and establishing a relationship with the term 'multifunctional' or 'multipurpose' object (building)?
- What are the basic causes of hybrid architectural structures?
- Is it possible to suggest the categorization of hybrid objects (buildings)?
- To what extent does the program determine the expressiveness of hybrids.
- Do hybrid objects (buildings) function more successfully than typical mono-functional architectural objects (buildings)!?

DEFINING A HYBRID



In biology, the term hybrid has been used for a very long time, and it is interesting to discuss the extent to which the term 'hybrid' is seen as being positive. At a time when genetically modified food is sold in shopping malls and when the awareness of citizens about the quality of food is growing, the advantages of such products are often highlighted. However, also, some sections of supermarkets, entitled "organic" are gaining more and more space. They propagate natural "imperfections" as a positive attribution. According to the definitions from the dictionary of foreign words, in biology, hybrids are animals or plants obtained by crossing individuals belonging to different species (Hrvatski jezični portal, 2019). From the time of the ancient Greeks to Kölreuter's systematic study of hybrid plants, Charles Darwin's "The Origin of Species", and Gregor Mendel's research on legumes, hybrids are understood to be an evolutionary fact that have many advantages over "pure" sources from which they originated (Sturtevant, 1965). Resistance to diseases, pests, harsher climatic conditions are all advantages that hybrid plant varieties have and the same goes for animals (mixed breeds) that genetically inherit the traits of their parents. Linguistically, a hybrid is a word formed from components that belong to different languages, such as a 'microcomputer'. In a figurative sense, a hybrid is something of different provenance or origin, so it can be said that "his ideas are a hybrid of anything and everything" (Hrvatski jezični portal, 2019). More recently with the outbreak of COVID-19 pandemic, many schools and faculties, organised the lectures in a "hybrid mode", where lectures were held in-person for a smaller group of pupils/students while the rest were sitting at their homes and were able to follow lectures online and in real time. That

form of delivering lectures was challenging for many teachers, but it was also the only means of bridging the gap between the classical (which was not feasible at the time due to restrictions) and the forced, online way of teaching.

Mixing of Colours (Fusion). Source: Freepik

In the field of technology, we have many examples of hybrids that are becoming "smarter". Bimetals, a combination of two connected pieces of different metals, are indispensable in electrical switches (from water heaters and irons to more complex devices), but in essence these are, by now, seen as "low-tech". In contrast, advances in technology have given rise to "smart materials", a relatively new name for materials and products that have variable properties and are able to change in terms of shape or colour in response to external stimuli. NASA defines "smart materials" (NASA, 2024) as materials that "remember" configurations and adapt to specific stimuli. Already already discussed in this context are "smart homes" which are loaded with technical devices and a mass of sensors that respond to external stimuli. The "IoT"[11] is just a logical continuation of the improvement of bimetals.

11 "Internet of Things."

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Over the past 10 years, the electrification of vehicles has intensified in the automotive industry. The intermediate phase in the transition from a fossil fuel car to an electric car is the hybrid phase. Today, there are almost no car manufacturers that do not have a hybrid vehicle in their range. In the automotive industry, a hybrid vehicle is one that combines any two sources of power (energy). An alternative definition is that *"a vehicle must have at least two propulsion modalities"* (Fuhs, 2009, p. 40). However, although at first glance it seems that the hybrid phenomenon in the automotive industry has nothing to do with architecture, the question arises as to whether an analogous connection can be established at the functional and visual levels. In the automotive industry, the emphasis is on propulsion while car design (interior and exterior) is almost identical when it comes to classic propulsion. On the other hand, how to qualify a camper van, which is essentially a road vehicle that is of a mobile character, arranged so that it has all the features of a home and in addition has a garage for an ordinary car? So, this is also a hybrid, which has nothing to do with the modalities of the propulsion, but with a combination of content.

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DEFINITION OF A HYBRID IN ARCHITECTURE

The realization that architecture is interpreted through the interaction of two components: technique and art, leads us to conclude that architecture itself is a hybrid, and for this reason it is even more difficult to define what "hybrid architecture" is.

If we observe the technical disciplines indispensable to the construction process, such as HVAC, then it is possible to see a similar interpretation of a hybrid, one that represents the crossing of systems or materials to yield better results. For example, the application of the hybrid approach to ventilation systems is a superior aspect of the approach to air conditioning, when compared to the classical (generally accepted) approach, as shown by published results in scientific papers. Research has shown that the energy saving potential of such systems is 30-35% (Ji, Lomes, & Cook, 2009, pp. 2245–2255). If we look at the systems for preheating domestic hot water in buildings, it is interesting to highlight the data from hybrid photovoltaic thermal collectors which, in addition to producing electricity, also serve to heat water. The obvious advantage of installing a collector on a building's facade is that compared to a normal concrete wall, heat is reduced because it is transferred to the fluid, instead of remaining in the wall and when using PV/T collectors, this reduction is from 53% to 59.2% (Ji, Lomes, & Cook, 2009, pp. 2245–2255).

In construction, reinforced concrete is an indispensable composite material, without which construction would be unthinkable today. The logic of crossing two materials that together have better design characteristics than each of them singly, has also been applied to hybrid lightweight sandwich systems. Instead of steel reinforcement, the tensile forces are taken over by the polymer while in the pressure zone there is normal concrete. The advantage of this "sandwich" in relation to the (now classic) reinforced concrete structure is lower mass but also the larger spans that can be achieved in relation to reinforced concrete slabs (Schuman, 2008, p. 138). Recently, cross-laminated wooden construction (so-called "XLAM") has both been increasingly researched, and used. Glued wooden slats are used here, which when using different types of wood (harder and lighter) depending on the purpose, get better results than when using a homogeneous piece of wood of one type. Where better load-bearing capacity is required or it is desired to increase elasticity, a combination of slats are used to achieve this and, in addition, due to the production process, it is possible to manipulate the lengths of the beams. Current research conducted by the CBD relates to the use of XLAM for the construction of garage parking systems up to 5 floors, and the fact is that such systems are five times lighter than reinforced concrete (Dujič, 2019). They require lower foundation costs, and are assembled on site with the construction speed of one floor per week, which goes in their favour, when compared to classical systems (Dujič, 2019). Those are just some of the reasons why there will be more such hybrid structures in the future.

After these insights into the interpretation and use of the term "hybrid" in related disciplines, it is interesting to note the diversity of interpretations of that same term in architecture. For example, one definition is that hybrid buildings are based on the use of technical advances in order to create a facility with maximum energy efficiency.[12] Although the set goal has been achieved, the question arises as to the justification of the approach, in which energy efficiency imperatives dictate the disposition and greatly influence the design. This is just one of the ways in which some architects interpret the term hybrid in contemporary architecture, while others view the hybrid through the modification of a product, such as a transport container for residential purposes. Something that was initially created for the needs of transport, was adapted in way that it can be used for other purposes, hence the term "cargo architecture". There are many examples of transforming such containers into hotel or student rooms or complete housing units. Futuristic projects, such as the autonomous passenger suite, announce new forms of service that combine mobility and accommodation, but at a different level than that currently available for railway accommodation.[13]

How to prove the claim that hybrid objects function more successfully than typical monofunctional architectural objects? As the term hybrid is primarily related to biology, it is implied that crossbreeding is done to improve the characteristics of new varieties compared to existing ones.

12 "Hybrid buildings are defined here as residential buildings that have the capacity to supply, in total, the annual operating energy requirements of their occupants by utilising locally generated (low or zero emission) energy sources. Operating energy includes energy for heating, cooling, lighting and domestic appliances (built-in and plug-in). At times when surplus energy is generated to its occupants' immediate demands, energy is supplied to the grid and if the dwelling is unable to generate sufficient energy for autonomous operation, energy is received back from the grid." (Newton & Tucker, 2009, pg. 11).

13 https://vimeo.com/293567974

From the examples of the use of the term hybrid in technical disciplines, the advantage of composite materials or systems that are superior to classical ones is again evident. Thus, it is similarly possible to analyse certain architectural features and compare them with each other. One can start from the assumption that in architecture we have two components of hybridity: functional and visual. In functional hybrids, one can start from the premise that the focus is on the permeation and symbiosis of different functions, while in visual hybrids it is reflected in appearance, for example in the integration of old and new.

Futuristic mean of transportation in modern city, AI-Generated image, Source: Freepik, Midjourney 5.2.

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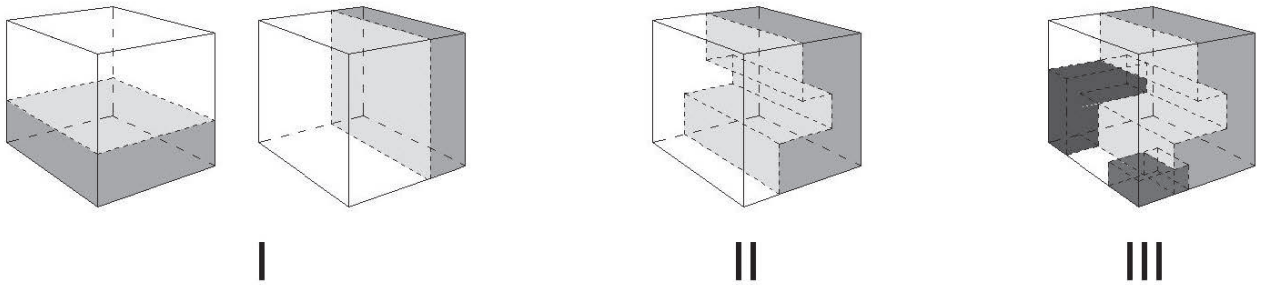
COMBINING THE CONTENT

The already mentioned architect Steven Holl, in the preface to Joseph Fenton's 1985 book Pamphlet Architecture 11: Hybrid Buildings, gives a brief overview of the topic of hybrids and raises the question of what are the pressures of the XX. centuries that impose combinations of architectural programs: *"Although there are examples of combined function buildings throughout the history (the house over the shop is prevalent in many ages and cultures), Hybrid Buildings developed most rapidly in the twentieth century..."* and "*The modern city has acted as fertilizer for the growth of architectures from the homogeneous to heterogeneous [expression] in regard to use. Urban densities and evolving building techniques have effected the mixing of functions, piling one atop another, defying critics who contend that a building should 'look like what it is'.*" (Fenton, 1985, p. 3).

Until Joseph Fenton's 1985 catalogue, hybrid buildings were ignored as recognizable building structures and were usually left to the "different purpose" category. Fenton believed that there was a clear distinction between hybrids and objects with different purposes, that is, that individual program content interacted with each other and that "they began to share intensities" (Fenton, 1985). What Fenton recognizes, but does not name, is that 'synergy' is the basic determinant of hybrid objects. Synergy therefore represents a positive attribution to the term hybrid, if one takes the economic interpretation that synergy is "*the complementarity of activities whose effect is greater than the sum of its parts*" (a+t, 2008, p. 7).

The basic premises that are imposed, are that synergy and optimization are specific determinants of the hybrid in architecture. Analogously, the crossing of different species in biology (i.e. genetics), in architecture means crossing different types that are (de facto) different typologies based on specific program content. Thus, one definition of a hybrid object could be: "an architectural structure that combines at least two typologies, and as a result has optimization (spatial capacity), is called a hybrid structure" (Burazor, 2012, p. 4).



Combining the content. Source: Authors.

THEORETICAL ASSUMPTIONS ON THE EMERGENCE OF ARCHITECTURAL HYBRIDS

What are the reasons for the emergence of architectural hybrids? The answer can be obtained only if an analysis of the fundamental factors that influence architecture is made. These factors are: theoretical settings, urban tendencies and economic imperatives.

The history of architecture abounds with different styles that are more or less related to theoretical assumptions. In the 20th and 21st centuries, this is somewhat more expressive and we have concrete examples of the influence of philosophical thought, such as that from Jacques Derrida, and the application of deconstructivism in Daniel Libeskind's buildings. What is common to every designed building is the approach to architecture, which involves creating a proposal (concept) and predicting how the object will behave in the future and thus respond to the needs for which it was built. In other words, an adequate design approach is of particular importance, because the design process involves finding and presenting the best possible solution to a given problem while predicting what the performance of the building will be after it is built. Architects have an obligation and responsibility to consider all available design solutions considering what is best for investors, users and also the wider community. They also have an obligation to explore design solutions based on hybrid concepts (as a general strategy), which should represent better starting points than classical modalities, according to the earlier accepted premise.

Hybrid Buildings: Function Fusion, Ryerson University, Toronto, Canada. Source: Openverse, UrbanGrammar.

Theoretical underpinnings for this can be found in the work of Philip Steadman: *The evolution of designs*, which points to many similarities that have been made throughout history, between the evolution of organisms and human products and artefacts, especially buildings. The concept of "biotechnology" interested architects in the 1920s and 1930s. This concept is based on the realization that in the evolution of plants and animals, nature has made a number of inventions that are embedded in the design itself, for example organs (Steadman, 2008). These "inventions" ingeniously solved the problems of functional and engineering nature for designers, from structural and mechanical problems to chemical and electrical ones. Architectural "organisms" were conceptually developed in the 1960's, when megastructures appeared in response to the urban solutions of Modernism. Thus, the founder of the Metabolist group, Fumihiko Maki (Schalk, 2014, p. 284) but others like Paul Rudolph and Archigram (Angelidou, 2015, p. 97), suggest mechanical organisms (buildings) and finally cities that can move. More recently, Rem Koolhas in his book Delirious New York presents a theory of the "Great" based on five theorems where he actually elaborates on the reasons why today we have large architectural structures that match smaller cities (a+t, 2008, p. 7).

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For example, the Kyoto Train station (Kyoto station, 2024), which covers an area of 238,000 m2 and, in addition to serving as a traffic hub, contains shopping malls, several small museums, cinemas, a theatre, multi-storey garages, playrooms, a hotel, administrative offices, restaurants and other services.

Overall, considering the events of the 20th century, architects have not merely passively observed advances in the field of hybridization (primarily in biology and genetics), but are trying to combine similar or different species of architecture. The importance of the architectural program for form and architecture as a whole, was written by the Dutch architect Rem Koolhaas, who recognizes two categories: "thematic program" or "different programs" (Fenton, 1985, p. 6). Thematic programs are similar programs that complement each other, such as the building of the former Provincial Government in Sarajevo, which serves as the building of the Faculty of Law, University of Sarajevo, the building of the Municipal Court in Sarajevo and also as a prison. An example of a different or diverse program can be found in Travnik, where there is a commercial space on the ground floor of the Sulejmanija mosque and a sacral space on the first floor. Whether it is a question of compatibility or complementarity of content, in the case of facilities that have several program determinants, a synergistic effect is expressed.

Sulejmanija Mosque, Travnik, BiH. Source: Authors.

THE INFLUENCE OF URBAN AND ECONOMIC STRATEGIES ON THE EMERGENCE OF HYBRID ARCHITECTURAL STRUCTURES

The answer to the question of what were the primary reasons for the emergence of hybrid architectural structures, was offered by Joseph Fenton, 35 years ago. He believes that the emergence of hybrid buildings in America was a response to the escalating values of land, as well as the limitations of the urban network. With limited horizontal expansion, the urban fabric began to move vertically, and buildings became larger and taller (Fenton, 1985). John Worthington accepts the emergence of new typologies and describes them as follows: "*Their common characteristics* [new typologies] *are that they have a variety of modes of public and private accessibility; an overlap of functions, with synergetic and complementary uses both within the node and as part of the wider urban network; and a recognisable image.*" (Moor & Rowland, 2006, p. 163).

New York City Skyline, USA. Source: Openverse, Katie Haugland Bowen.

Conurbations, gravitational fields and focal points, are just some of the terms used in urban practice to try to describe the mutual influences of built structures. The growth of cities has led to the fact that once neighbouring cities sometimes merge, forming large urban units. Thus, with good infrastructural connections, the movement of goods and people are facilitated, and then cities, just like city districts, take on different roles, profiling themselves as centres of good business. For example, in the Netherlands, the city of Amsterdam takes on the role of financial sector and cultural centre, whilst Utrecht is a city for education and media, the Hague is a government centre, while in Rotterdam and Delft, the focus is on work and education (DigiMarCon, LLC., 2019). Thus, the growth of cities has led several of them to unify into conurbations, so it is not surprising that a similar processes of unification of several programs within one facility can take place.

Due to the constant economic pressure for a quick return on investment and profitability, successful models are being sought that will ensure financial survival. The size of the object has a very important role because with its size, and the number of contents in it, the field of influence increases and the number of users who will gravitate to such an object increases. The best illustration of this process is the post-war construction of shopping malls in Sarajevo. Initially, they were of somewhat smaller volume, positioned in strategic places where they gradually starved the small businesses there that eventually closed. As investments increased, so did the facilities, becoming larger and larger, becoming city landmarks (SCC in Sarajevo for example). Focus points today are less on public facilities, and the new structures, which by their size dominate, are predominantly for commercial content. In addition to commercial, other focal points are sports and recreational facilities (stadiums), traffic hubs (railways and airports /Urban Hub, 2024), educational or health institutions, film studios and eco-technology parks (Collins, 2013).

Is it possible to apply the concept of 'Hybrid Economy' to hybrid buildings? As paradoxical as it may sound, free stuff seems to be the most expensive! At a time when we store almost all of our digital footprint on cloud services and agree to submit this content for the purpose of "improving the user experience" or targeted advertising, the price of privacy seems to be declining. Fences are still being built around the houses to protect the occupants from being seen, while at the same time others are posting photos from those same homes, where nothing is hidden anymore. Today, privacy exploitation is very common, where

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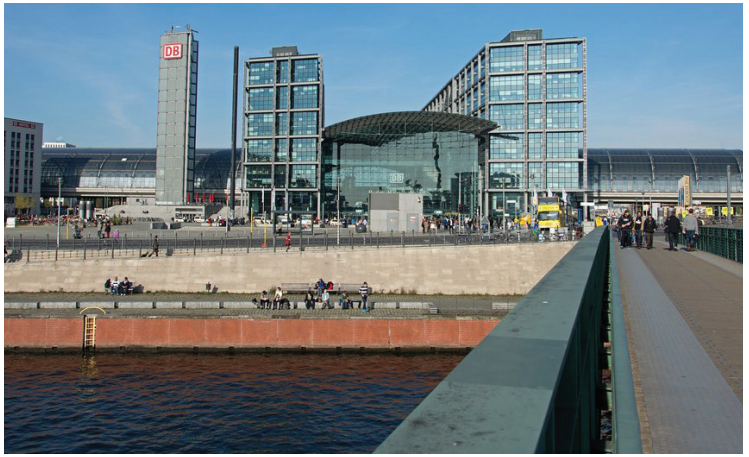
content sharing is commercialized. Lawrence Lessig explains and qualifies the notion of 'hybrid economy' in more detail, stating that it represents a qualitative upgrade on the commercial and sharing economy (Lessig, 2008, p. 122). Google, Facebook, Twitter, Instagram, Snapchat, Wikipedia, Flickr, YouTube, and a vast number of free applications and games, have emerged thanks to this type of economy. Internet services encourage the creation of online communities or collaboration, and destruction often occurs as soon as money is involved. The moment Facebook, for example, asked users to pay for the use of that platform, it would immediately lose a huge number of users, which would be irreparably damaging to shareholders. Philosopher Michael Walzer notes that *"people live in pervasive spheres of social understanding. What is appropriate in one sphere is clearly not in another"* (Lessig, 2008, p. 147) and therefore we pay with our privacy for the "free" content that is available to us. However, if the positive attribution of the hybrid economy is applied to hybrid buildings, then investors can be expected to provide content that benefits the wider community because the impact of socialization is particularly important for commercial success. If people are offered free quality content, then such places will be visited and the accompanying, commercial content is there as a supplement or upgrade.

From this review of the influential factors in the emergence of hybrid architectural structures, it is possible to conclude that the economy is the basic generator for the emergence of hybrid structures. Such structures would not arise solely because of architects' visions of the direction in which architecture should develop, because issues of form, rather than cost-effectiveness, have historically been more interesting to architects and far more the subject of their theoretical considerations. Investors, in their pursuit of increasing profits, but also investment insurance, are the real initiators of the emergence of hybrid structures (Burazor, 2012).

COMPARISON OF HYBRID AND TYPICAL ARCHITECTURAL STRUCTURES

How is it possible to compare different typologies? The answer is to find common characteristics that can be analysed. Common to every new facility is the investment framework. The advantage of smaller facilities is that it is usually funded by one investor, so it is easier to respond to design challenges and requirements of one person / company. However, this may be a disadvantage when, due to the lack of initial funds, and due to the impossibility of further borrowing by investors, the capacity of the planned facility is reduced, which can later negatively affect the business. An example could be the construction of a smaller shopping centre, which then fails to impose itself on the market as a location that attracts a sufficient number of visitors, so the rent is reduced or cancelled. Another example is the construction of a hotel that has a reduced accommodation capacity, although the location can handle a larger number that would bring higher earnings and a faster refund of investment. For this reason, when it comes to larger investment projects, they are most often financed from multiple sources. However, due to the effect of portfolio diversification, i.e. investing in several different business ventures to reduce risk versus, investing in just one project, investing in multi-function facilities is more attractive to investors, making it easier to close the financial structure. This is ultimately a hybrid concept at the level of ownership structure and management.

Qualitative analysis in terms of advantages and disadvantages on already constructed facilities is a very important factor in the design. At this stage, the shortcomings of the hybrid compared to the classical is reflected in



Berlin Main Train Station, Germany. Source: Openverse, Rob Dammers.

the lack of references to a given topic, because it is rare to find examples of hybrids with the same program, while for known typologies it is much simpler.

Philip Johnson once remarked that "*Architecture is the art of how to waste space*."[14] (Ratcliffe, 2017). If Johnson's cynicism is ignored, then two ways in which architects negatively affect space can be discussed. Whether it is urbanism or building construction, mistakes are possible when dimensioning the space, so that they can be either oversized or too small. When it comes to the negative connotations of both, then undersized spaces are not adequate to perform the role for which they are intended, which makes such an object almost unusable. On the other hand, an unnecessary increase in dimensions results in higher investments both in the construction phase and in the exploitation phase. In the post-war housing construction in BH, it is possible to find many examples of both mistakes. Apartments are being built with small rooms and toilets that can barely hold all the equipment, or others are being made with oversized spaces, at the expense of the number of rooms, so one-bedroom apartments of 60m2 cannot find buyers on the market.

At the level of the project program, it is not possible to achieve special savings in terms of occupied areas with monofunctional facilities. There are standards and norms that must be adhered to, however, when combining content, it is possible to achieve certain savings based on the number of users who use the space. For example, the size of the entrance halls, the number of stairs and elevators, or the total number of toilets can be affected. Therefore, the advantage of hybrid is in the rationalization of spatial needs in response to the analysis of requirements. Those requirements, in turn, directly affect the economic component through the following categories: investment value, maintenance costs, energy consumption, utilities and employee benefits. If the expenses are lower, from the position of the investor, the hybrid solution is better and works more successfully.

Axiomatically, if savings are made in the total required area of the new structure, then the investment value is lower. Due to the rationalization during sizing (dimensioning), the advantages of the hybrid are also visible in the maintenance costs of the facility where we have fixed and variable costs. Fixed costs are most often related to the surface of the object, and variable to the actual consumption of a resource, which is again in relation to the size of the object. For example, the fees charged in BH are tied to m^2 of built-up area (bulky waste collection, maintenance of common areas, real estate tax, etc.), so the total size of built-up area plays a significant role in saving fixed costs. Variables are harder to influence because they are related to user's habits. Regardless of whether it is a monofunctional or hybrid facility, one that achieves lower energy consumption (due to the use of appropriate, more efficient hybrid installation systems for instance), can be qualified as better or more successful. However, when it comes to hybrids, the cost of heating / cooling a building is lower because it is generally a smaller volume compared to two or more monofunctional buildings. Depending on the number of employees, the costs of salaries and other personal income often exceeds the material costs, costs of production services, depreciation and intangible costs of a company. For example, the savings on the total number of people working at the hotel reception or securing the facility is very large. For a workplace that implies the presence of workers for 24 hours, it is necessary to employ a minimum of 4 people to work in shifts (respecting the Labour Law in BH, which is similar to EU laws), which is an employer's expenditure of 2572 BAM per month, if the minimum hourly rate in BH is paid (Chronos, 2024). Of course, when it comes to a skilled workforce, the costs are many times higher and therefore it is very important for the owner of the company to make optimal use of available human resources. Therefore, it is easy to see why the hotel and the school, as separate facilities (with all the necessary services and staff), have higher costs than when they are combined into one facility.

Although economics plays a significant role in our lives, it is not and should not be the only category that measures the performance of an object. Rather it is customer satisfaction - a measurable category - that is the most important.

Whether it is a recommendation for a new film or accommodation, the comments of other users are very useful to us (see for example, booking.com or Airbnb). Of course, it is first necessary to prevent possible manipulations and to counter malice. Positive reviews will certainly influence our choice because if the price of some accommodation units is identical (with similar / identical equipment), then we will certainly be guided by the experiences of others. When it comes to buildings, users can fill out various surveys that can quantify their (dis)satisfaction. However, regardless of the conduct of surveys, the arguments in favour of

14 Philip Johnson, New York Times, 27th of December 1964. (Ratcliffe, 2017)

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hybrid objects are a sociological and cultural component that contributes to architectural quality. The biggest advantage of buildings where it is possible to do more work in one place is that they save time. Users do not have to go to several addresses, waste time in transport or search for parking. The building, which represents the functions of housing, work, catering and trade, offers a number of comparative advantages. The socialising component is particularly present in hybrids due to the imposed human interaction in such spaces, which can have a positive impact on quality of life.

In summary, from the point of view of cost analysis and spatial efficiency, it is evident that hybrid buildings represent a superior type of building than individual monofunctional types. This is primarily reflected in the reduction of investment value and operating costs due to the rationalization of space, and when the facility is viewed as a physical asset that contributes to the company's profit, the effect of reducing staff numbers is a comparative advantage for management.

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Miscellaneous significant structures

HOLIDAY HOME

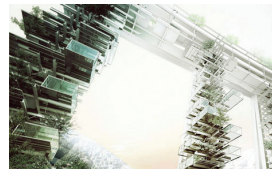
VIADUCT HOLIDAY HOME

Architects: OFF Architecture
Location: Reggio Calabria, souther Italy
Use: Holiday Home
Structure: Steel Structure
Realization: not realized
Length:
Width:

This viaduct in southern Italy, built in the 1960s, remains unfinished as part of the highway from Salerno to Reggio Calabria. Despite offering spectacular mountain views, it has been abandoned for decades. In a new proposal by OFF Architecture, PR Architect, and Samuel Nageotte, the viaduct is transformed into a stunning vertical village of vacation homes. The concept utilizes the massive pylons of the bridge as the foundation for a high-rise vacation complex that descends from the bridge's horizontal surface to the ground.

"The project was designed to use minimal construction materials, encasing the existing support system with a 'pile and deck' technique to stack residential and commercial spaces without disturbing the site. The vacation homes are intended for Northern European snowbirds seeking to enjoy Southern Italy's warm, sunny winters," explain the architects.

Viaduct holiday home (Concept), Italy. Source: Weburbanist.



Viaduct holiday home (Concept), Italy. Source: Weburbanist.

URBAN PARK

HIGHLINE

Architect:	James Corner Field Operations with Diller Scofidio + Renfro
Location:	New York
Use:	Urban Park
Structure:	Steel Structure & Concrete Slabs
Realization:	built
Length:	2.4 km
Width:	10 - 15 m
Floor height:	6 m

The High Line originally served as a West Side industrial railway, built in the 1930s for freight trains. When train operations ceased in 1980, the structure became an elevated wasteland, slowly reclaimed by nature. In 2003, an open competition was launched to explore potential uses for this 2.4-kilometer stretch of elevated infrastructure through downtown New York.

"Through a strategy of agri-tecture—part agriculture, part architecture—the High Line surface is digitized into discrete units of paving and planting, assembled along the 1.5 miles into a variety of gradients from 100% paving to 100% soft, richly vegetated biotopes," explained DS + Renfro.

Today, the space functions as an urban park, elevated above New York's bustling streets.

Urban Park, New York, USA. Source: High Line.

Urban Park, New York, USA. Source: High Line.

INHABITED BRIDGE

PONTE VECCHIO

Architect: Unknown
Location: Florence, Italy
Use: Housing & Retail
Structure: Stone Foundation
Realization: built
Length: 84 m
Width: 32
Storeys: 4

The Ponte Vecchio is believed to have originally been constructed as a wooden structure during Roman times. „After being destroyed by a flood in 1117, it was rebuilt as a stone bridge in 1345, making it one of the oldest bridges in Europe“ (Wikipedia).

Since its construction, the Ponte Vecchio has served as a marketplace, reportedly operating as a tax-free zone. Shops were initially located on the ground floor, with housing added on top—a common practice in medieval Europe. Originally, the shops were occupied by butchers. „Today, the Ponte Vecchio is a popular tourist attraction in Florence, with most of its tenants now being jewelers, art dealers, and souvenir sellers“ (Brittanica).

The Ponte Vecchio “Old Bridge”, Florence, Italy. Source: Wikimedia Commons, Ray in Manila.

The Ponte Vecchio “Old Bridge”, Florence, Italy. Source: PxHere.

The Ponte Vecchio “Old Bridge”, Florence, Italy. Source: PxHere.

EXAMPLE FROM THE TUDOR ERA INCLUDING HOUSING AND COMMERCIAL USE

LONDON BRIDGE - TUDOR ERA
(Circa 16th century)

Location:	London, UK
Architect:	Peter of Colechurch
Use:	bridge, housing, commercial, public space
Structure:	masonry superstructure with glass-encased steel construction
Realization:	built
Total length:	269 m
Total width:	32 m
Clearance below:	8,9 m
Floor height:	varies
Storeys:	1-7
Floor area:	8640 m2
Connection system:	bridge

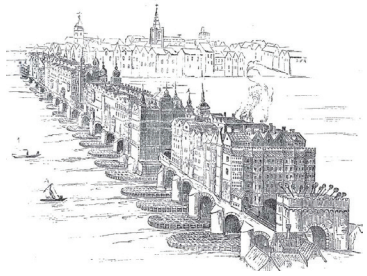
There has been a bridge crossing the Thames at this location for almost 2000 years. The first bridge was built by the Romans, and was a timber construction.

Over the centuries, the bridge has evolved through several stages. King John (who reigned from 1199-1216) decided to build houses on the bridge, and it was soon heavily populated. After a while the bridge was turned into a separate urban district with its own alderman.

During the Tudor era, there were several hundred buildings on the bridge, ranging up to seven floors in height. Due to the bridge's increasingly dense population, the risk of fire became very great, and in 1633 a third of the bridge was destroyed in a large fire.

It is interesting to study the evolution of this urban typology. Throughout the ages its complexity has varied greatly, and it has possessed a range of different functions and programmes. Today the bridge is merely a bridge for car traffic, but maybe this could change in the future?

Old London Bridge, UK. Source: Pixelhostel, William Harbison.



NAVIGABLE AQUEDUCT

MAGDEBURG WATER BRIDGE

Location:	Magdeburg, Germany
Use:	Canal boat bridge
Structure:	steel and concrete
Realization:	2003
Total length:	918 m
Longest span:	106 m
Width:	34 m
Clearance below:	6,25 m
Conection system:	bridge

The Magdeburg Water Bridge is a remarkable navigable aqueduct in Germany, linking the Elbe-Havel Canal with the Mittelland Canal, enabling ships to traverse the Elbe River. „At 918 meters, it holds the title of the longest navigable aqueduct in the world“ (Amusingplanet).

Historically, the Elbe-Havel and Mittelland canals converged near Magdeburg but on opposite sides of the Elbe. This required ships to take a 12-kilometer detour, descending from the Mittelland Canal via the Rothensee boat lift into the Elbe, navigating downstream, and then entering the Elbe-Havel Canal through the Niegripp lock. „Low water levels in the Elbe often impeded fully laden canal barges, necessitating the off-loading of cargo“ (Wikipedia).

Construction of this water bridge began in the 1930s but was interrupted by World War II and the subsequent division of Germany. „Work resumed in 1997, and the aqueduct was finally completed and opened to the public in 2003“ (Wikipedia).

Magdeburg Water Bridge, Germany.
Source: Wikimedia Commons, Olivier Cleynen.

Magdeburg Water Bridge, Germany.
Source: Wikimedia Commons, Maarten Sepp.

Magdeburg Water Bridge, Germany.
Source: Flickr, born1945.

CANTILEVER RAIL BRIDGE

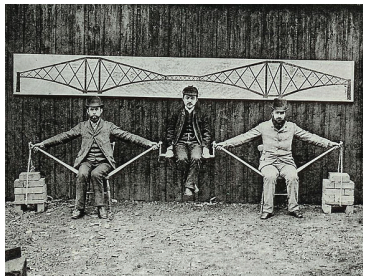
FORTH BRIDGE

Location:	Edinburgh, UK
Architect:	Sir John Fowler and Sir Benjamin Baker
Use:	cantilever bridge
Structure:	cantilever steel structure
Realization:	1890
Total length:	2,5 km
Longest span:	521 m
Clearance below:	46 m
Connection system:	bridge
Daily traffic:	190-200 trains

The Forth Bridge features three double cantilevers with two suspended spans of 521 meters each, making it one of the longest bridge spans in the world at the time of its construction. The rail level, as mandated by the Admiralty, is 46 meters above high water. Each tower comprises four steel tubes, each 3.7 meters in diameter, reaching a height of 110 meters above high water. The foundations extend 27 meters into the riverbed, bringing the total height from the foundations to the top of the towers to 137 meters. The bridge's total length, including its approach viaducts, is 2,467 meters, with the main structure measuring 1,630 meters from portal to portal (Theforthbridges).

Designed by Baker and Fowler, this bridge was the first major construction in Britain to use steel, incorporating 53,000 tonnes of the material. The design was meticulously balanced, allowing for a maximum thermal expansion of 420mm over the 1,630-meter steel central structure. The bridge also includes 6.5 million rivets, which alone weigh 4,200 tonnes (Theforthbridges).

The Forth Bridge (Cantilever Bridge), Edinburgh, UK. Source: Wikimedia Commons, MrMasterKeyboard.



The Forth Bridge (Cantilever Bridge), Edinburgh, UK. Source: Wikimedia Commons, Wilhelm Westhofen.

The Forth Bridge (Cantilever Bridge), Edinburgh, UK. Source: Flickr, Carlos Lorenzo.

TRAIN BRIDGE

SKANSENBRUA

Location:	Trondheim, Norway
Architect:	Joseph B. Strauss
Use:	Transportation
Structure:	Steel structure with a concrete plumb
Realization:	built 1918
Length:	52 m
Width:	

The Skansen bridge is a railway bridge in Trondheim. It connects Dovrebanen to the Western channel port and onto the artificial island Brattøra, which Trondheim Central Station is on. Skansen bridge is a bascule bridge, which means that the bridge span would be raised as tall boats to pass under. The bridge's sailing height when down, is 4.0 meters. With its 52 meters, it is the largest moving bridge in Norway.

Skansen bridge was built in conjunction with Dovre Man building, and replaced the old narrow gauge bridge that stood there previously. The bridge has two tracks, but only one is used regularly. The bridge is designed by Joseph B. Strauss , who was also responsible for the world-famous bridge Golden Gate Bridge in San Francisco.

The bridge has a counter weight, as well as motors and gears to raise and lower the flap on the bridge.

Skansen bridge, Trondheim, Norway.
Source: Wikimedia Commons, Petr Šmerkl.

Skansen bridge, Trondheim, Norway.
Source: Wikimedia Commons,
Petr Šmerkl.

Skansen bridge, Trondheim, Norway.
Source: Flickr, Superlangbein.

TRANSPORTATION

THE GOLDEN GATE BRIDGE

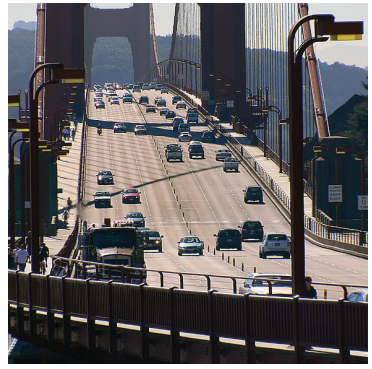
Architects:	Joseph Strauss, Irving Morrow, Charles Ellis
Location:	San Fransisco, USA
Use:	Transportation
Structure:	Suspension bridge, Steel
Realizazion:	built 1937
Length:	2.7 km
Width:	27.4 m
Longest span:	1280 m
Daily traffic:	110.000

The Golden Gate Bridge is a suspension bridge that spans the Golden Gate Strait, connecting San Francisco Bay with the Pacific Ocean. This iconic landmark links San Francisco, situated at the northern tip of the San Francisco Peninsula, to Marin County. It stands as one of the most recognized symbols of San Francisco, California, and the United States.

Honored as one of the Wonders of the Modern World by the American Society of Civil Engineers, the Golden Gate Bridge is described by Frommer's travel guide as "possibly the most beautiful, certainly the most photographed, bridge in the world." Opened in 1937, it held the record for the longest suspension bridge main span in the world, measuring 4,200 feet (1,280 meters), until 1964 (Goldengate).

The bridge is a favorite destination for pedestrians and bicyclists, featuring walkways on both sides of its six-vehicle traffic lanes (Goldengate).

The Golden Gate Bridge, San Fransisco, USA.
Source: Flickr, Wally Gobetz.



The Golden Gate Bridge, San Fransisco, USA. Source: Wikimedia Commons, Bernard Spragg.

The Golden Gate Bridge, San Fransisco, USA.
Source: Wikimedia Commons

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Summary

The Examples and texts in this book come TOGETHER as a result of over a decade of the authors' experience in urban planning and architectural design across Norway and Bosnia and Herzegovina. Since there ARE a number of books and publications that ALREADY deal with the topic of the classification of buildings in a systematic order, the focus of This book was shifted from the most common typologies and directed to those that are less known/represented.

The sole intention is not only to categorize and explore these typologies, but to bridge gaps in existing classifications by giving prominence to lesser-known examples. There is a differnce in the ways the examples are treated and presented. In many cases, historical reference to the archetypes is given following the evolution of architectural forms to contemporary buildings. In that process, the commonalities and differences across cultures and environments are emphasized. Authors underscore the complexity of modern architectural typologies and their classification criteria, which vary widely based on functional, structural, and stylistic considerations. Simultaneously, significant effort was dedicated to exploring atypical or unconventional buildings, delving deeper into their reasons for existence and their significance in architectural discourse.

This is where the genuine value and contribution of this publication become evident. The publication serves as a critical reflection on architectural diversity and aims to contribute to ongoing discussions in the field, offering insights into both familiar and unconventional building types through detailed illustrations, historical timelines and technical data.

Conclusion

Not-so-typical architectural structures represent a response to social stimuli, such as new tendencies in art, culture, education or new modalities of work and housing. The humane aspect and holistic approach to architecture must never be overlooked and new typologies should, in principle, bring new qualities because they represent an upgrade to existing concepts.

From the discussion on the topic of pavilions, it is evident that they still represent an excellent platform for experimentation. Today, their origin is usually associated with cultural, sports or promotional events, when people wanted to show something new and different, regardless of the cost. That is why the pavilion in architecture is equivalent to similar concepts in the automotive industry, as it seeks to *design the future*.

Hybrid structures are an inexhaustible source of inspiration for space design. The possibilities of combining content are relatively large and when the specific context, in which they are planned, is considered, then we get exceptional design challenges.

How to use the collection/collected examples

Each of the examples presented is to be read in its geographical, cultural, societal, political and historical context. This being said, the overviews given and detailed representation of the following examples, do come with some general data and representative pictures/plans to make use of them. This should help the reader in understanding that building typologies are created as a result of their its context, but also partially because of other building typologies.

Reviews

The (A) Typology index is a significant effort to classify building typologies based on functional programs and context. Each typology is analysed with introductory diagrams that help the reader quickly understand the design principles behind architectural forms. A chronogram shows the evolution of each typology over time, highlighting the impact of advancements in building technology and society. Although it doesn't cover every detail, it provides a valuable framework for understanding how building codes can adapt to different contexts, aiding architecture students in developing efficient, site-specific concepts for sustainable development.

Luca Finocchiaro PhD, MA, MSc

The book „(A)TYPOLOGY INDEX – An overview of typical and atypical architectural concepts" is the result of a significant effort to classify, define, and explain a wide range of architectural typologies in relation to their program, social and natural environment, and historical genesis. Given that this is a demanding, complex, and ambitious endeavor dealing with an ever-evolving subject, this manuscript does not function as a closed and final whole. Despite the impressive scope of typological categories covered, it represents only a beginning, a first edition, which should, over time, be supplemented to follow the development of what is happening in practice and to address topics that, despite the authors' best intentions, in accordance with the scope of the task, have remained untreated. It is precisely this factor of openness that makes the book a unique and relevant work, which consistently strives to keep pace with time and the changes that time brings.

V. prof. dr. Vedad Islambegović